The Northwestern MILLER

MILLING PRODUCTION SECTION

**Symposium . . .**

# *Technological Training In the Milling Industry*

**By George E. Swarbreck**
**Editor, The Northwestern Miller**

TO a man, top executives of the milling industry in the U.S. and Canada subscribe to the proposition that more and better trained technologists are a vital necessity for the future well-being of the flour producing business. The statement—call it a cliché if you wish—finds only proponents and no opponents.

And if an individual miller in North America finds himself luxuriating with a team of first class technical staffers right now, with no shortage on his immediate horizon, let him look into the future, for that shortage could hit within foreseeable time. The consensus of executive thinking is that the danger is there.

True, intelligent on-the-job training programs are playing an important part in bringing along suitable young men. But take a look at the background of any young production executive in a major plant today and you will invariably find a college graduate. The day of the "dusty miller," who has worked up the ladder of experience, is not yet past, but the new mechanics of flour milling are such that higher education is becoming a necessity rather than a luxury.

George E. Swarbreck

The field is wide open for the accomplished technician. Already, several firms have reached out across the Atlantic Ocean to bring in men from Britain, Germany, Switzerland and from Scandinavia to take positions in their plants.

### Too Few Enrollments

If a miller needs a well-trained technologist, where does he look? Sometimes within the ranks in his own plant if his supervisors have taught well. But many millers are looking to Kansas State College, Manhattan, Kansas, where there exists the only milling school on this continent. Reports Dr. John A. Shellenberger, head of the department of flour and feed milling industries: "Almost daily we get frantic appeals for technical personnel which we cannot supply, and yet we cannot get effective assistance in recruiting young people to take the instruction which our various institutions are equipped and prepared to do."

Flour milling does not sit alone with its problem. Enrollment in all phases of agriculture is decreasing at institutions of higher learning, an unfortunate situation because if there ever was a time when agriculture needed well trained personnel, it is now.

In September of last year, only 12 freshmen enrolled in the flour milling school at K-State. "There should have been 50 or 60, at least," laments R. B. Laing, vice president, Abilene Flour Mills Co., who is playing an active role in propagating the case for milling education. "No doubt," he concedes, "this disinterest in milling by young men of this country was partly caused by the fact that the flour mill burned down, but now that the mill is to be rebuilt with the very latest of machinery and equipment, young men with the right qualifications should consider flour milling as their careers."

"New methods in milling, pneumatic and conventional, will bring opportunities to well trained young men," Mr. Laing asserts. "Progress in milling is being noted all over the world and good positions are and will be opened to those who prepare for them. The training at K-State will fit the graduate well for these positions."

### The Russian Comparison

Dr. Shellenberger, in an article which appeared in this publication last February, cited the training facilities provided in the USSR and in Europe as evidence that the U.S. is lagging.

Gerald S. Kennedy, chairman of the board, General Mills, Inc., expresses his point of view on that evidence: "I do not think we should arrange for the training of milling technologists because of what Russia is doing or Germany, Switzerland, England or any other country, for that matter. I think our technologists should be trained in light of the needs of the U.S. and in relation to the educational system which has evolved here. We cannot and should not do as they do in the Soviet Union, 'compel a student to return to his previous employment' in the event of failure. This is America. Whether we like it or not, the establishment of flour mills in countries other than those historically engaged in the art and commerce of milling will proceed apace and our primary objective must be to train our young men with the requirements of American usage being foremost in our minds in planning that training."

Many millers, asked to comment on the training problem, seized on the same point. Here is a Canadian opinion, expressed by Graham M. MacLachlan, executive vice president, Maple Leaf

(Turn to SYMPOSIUM, page 21a)

* * *

## Symposium Contributors

(In Order of Comment)

Dr. John A. Shellenberger, Head of the Department of Flour and Feed Milling Industries, Kansas State College, Manhattan, Kansas.

R. B. Laing, Vice President, Abilene Flour Mills Co., Abilene, Kansas.

Gerald S. Kennedy, Chairman of the Board, General Mills, Inc., Minneapolis.

Graham M. MacLachlan, Executive Vice President, Maple Leaf Milling Co., Ltd., Toronto, Canada.

George E. Kelley, Executive Vice President, Bay State Milling Co., Winona, Minn.

Philip W. Pillsbury, Chairman of the Board, The Pillsbury Co., Minneapolis.

E. Walter Morrison, President, The Morrison Milling Co., Denton, Texas.

John L. Locke, President, Fisher Flouring Mills Co., Seattle, Wash.

Fred M. Atkinson, Chairman of the Board, Atkinson Milling Co., Minneapolis.

Leslie A. Ford, President, Shawnee Milling Co., Shawnee, Okla.

**Special report . . .** **. . . on visit to USSR**

## U.S. RUNNING BEHIND RUSSIA IN FACILITIES FOR TRAINING MILLING TECHNOLOGISTS

**'It is easy to answer the question regarding where the U.S. stands in milling education compared to the Soviet Union, Western Germany and Switzerland, because the aforementioned countries have equipment for training students in this field, and the U.S. does not.'**

By Dr. John A. Shellenberger
Head, Department of Flour and Feed Milling Industries, Kansas State College

THE launching of Sputnik I by the Soviet Union in October, 1957, served as a giant scare to arouse the American people from their smug assumption that the U.S. led in all phases of scientific endeavor. Why the average citizen should have had the preconceived idea that the U.S. leads in all phases of technical achievement is difficult to understand since scientists are well as observers as had been the case at previous meetings in Vienna and Hamburg. With this in mind, and knowing that Dr. Natalie Kisseleff, director of the Soviet Scientific Research Institute for Grain, was to be there, I wrote to find out if it would be permissible for [illegible] to visit the milling school and the [illegible] the meeting.

VISIT TO MILLING SCHOOL. On arriving in Moscow, I went first to the USSR Millers' governing [illegible]. It is located in the [illegible] of the [illegible] by Dr. K.

IN TWO SECTIONS
SECTION TWO

APRIL 14, 1959

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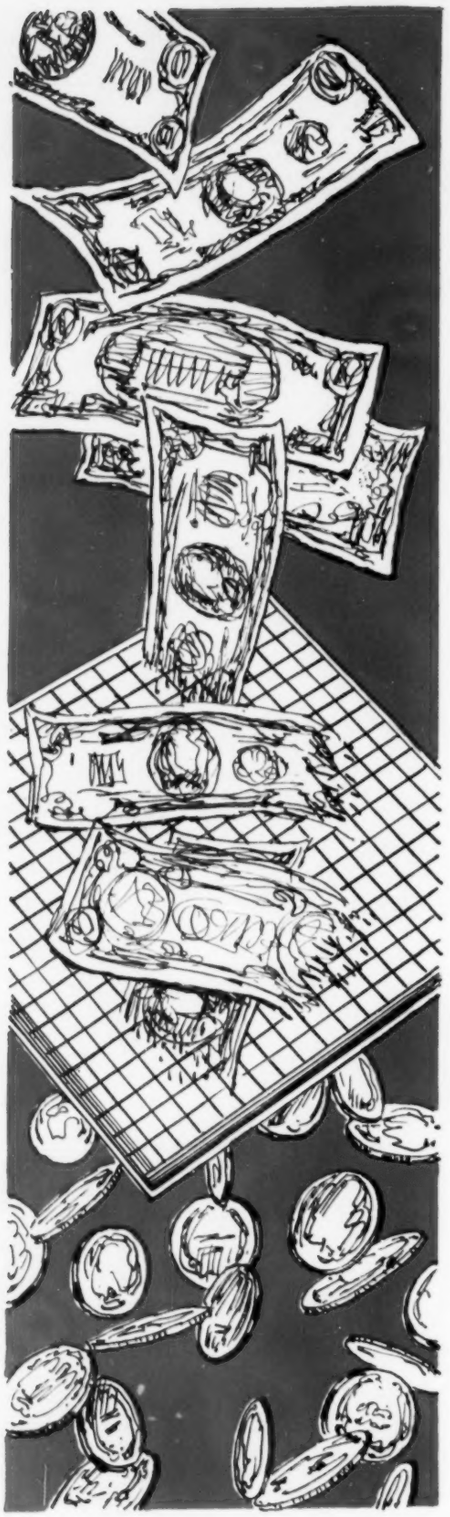

# PLANNED ECONOMY...

Like many other industrialists, millers' cost of doing business is mounting and calls for a review of buying and manufacturing procedures.

Basic economy demands getting the most in service and production for your dollar. In the sifting operation this points to the use of SWISS SILK.

No other textile will give as long runs with steady flow of quality flour.

No other textile can offer such economical shutdown-free performance as SWISS SILK, the only sifting textile that has been in constant preferred demand for more than a century.

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Program of the 63rd Annual

# TECHNICAL CONFERENCE and TRADE SHOW

## Association of Operative Millers

### Sunday, May 10, 1959

1:00 P.M.—Registration, Mezzanine, Sherman Hotel.

### Monday, May 11, 1959

9:00 A.M.—Registration, Mezzanine Floor, Sherman Hotel.

9:00 A.M.—Executive Committee Meeting.

9:00 A.M.—Technical Committee Meeting. Rooms for committee meeting will be posted on bulletin board.

12:00 Noon—SWISS SILK-KRESSILK, Complimentary Luncheon, Ballroom.

Call to Order 63rd Annual Technical Conference—AOM President R. C. Bradford.
National Anthems, U.S. and Canada
Invocation—Rev. Clinton C. Cox, D.D., Pastor, Drexel Park Presbyterian Church.
Welcome to the Sherman Hotel, Earl R. Benedict, Sales Department.
Address of President .....R. C. Bradford
Report of the Treasurer .....George S. O. Smith
Report of the Vice President-Secretary..Donald S. Eber
Report of the Committees:
Technical .....Tibor Rozsa
Sanitation .....George B. Wagner
Educational .....Prof. E. P. Farrell
Special Communications.
Appointment of Committees by President.
Adjournment.

### Monday Evening, May 11, 1959

Annual Allied Trades Party, Ballroom.

### Tuesday, May 12, 1959

9:00 A.M.—Meeting called to order. Drawing for On Time Award, Assembly Room.
Presiding Officer .....President R. C. Bradford
Welcome from Mill Management.....D. H. Wilson, President Eckhart Milling Co., President, Millers National Federation.
Proven Profits from Impact Milling.....R. J. Hoskins, Manager, Entoleter Division, Safety Industries, Inc.
Pneumatic Conveying Fundamentals.....Jack Kice, Chief Engineer, Kice Metal Products Co.
Application of Scales in the Flour Milling Industry.... John Wingfield, Colorado Milling & Elevator Co. (This is a Technical Committee Project.)

1:30 P.M.—Meeting Resumed. Drawing for on time award..... D. B. Pratt, Director, Quality Control, Pillsbury Co., Presiding.
Flour Requirements for the Baker Process Do-Maker... Dr. Carl L. Fortmann, Director, Research, Wallace & Tiernan, Inc.
Baker's Viewpoint on Flour Mill Sanitation..Fred Vitale, Director of Sanitation, Continental Baking Co.
What the Mill Chemist Expects from the Miller..... T. C. Buzelle, Director, Quality Control, General Mills, Inc.
Out of the Same Bag.....Ralph LaKamp, Director of Quality Control, Kroger Food Foundation.

### Wednesday, May 13, 1959

8:30 A.M.—Closed Session, Active Members Only, Election of Officers, Assembly Room.

9:00 A.M.—Open Session, Drawing for On Time Award. Tibor Rozsa, Chairman, Technical Committee, Presiding.
WHAT'S NEW??
Type D. Pneumatic Double Aspirator....Eric Stanger, Simon-Carter Co.
Bulk Flour Stations .....W. P. Edmunds, Superior Separator Co.
New Double Deck Purifiers.....H. Vanderlip, Allis-Chalmers Mfg. Co.
Duplex Packer .....Arthur J. Burke, Richardson Scale Co.
New Packing Developments .....R. J. McDonald, Bemis Bro. Bag Co.
Industrial Utilization of Wheat and Flour....Dr. Fred Senti, USDA.
Subsieve Sizer Particle Size Measurer..Theodore Poulos, Fisher Scientific Co.
Automatic Check Weigher.....W. J. Scheisser, Exact Weight Scale Co.

12:00 Noon—Luncheon Recess.

1:00 P.M.—Drawing for On Time Award.
WHAT'S NEW??—Continued.
Flour Mill Feed Bin Discharger.....Fritz Schiess, Buhler Mill Engineering Co.
Continuous Weigher .....Donald E. Gerberich, Stephens-Adamson Co.
A Mechanical Device for Detecting Hidden Infestation in Wheat.....Dr. Lyman Henderson, Head, Stored Products Insect Section, USDA; Buhler Mill Engineering Co.
Dry Flow Meter .....Frank Ofner, Industrial Processes, Inc.
Centrifuge Sedimentation Particle Size Measurer.... K. T. Whitby, University of Minnesota.
Pneumatic Wheat Unloader.....Roy Gorgen, Day Sales Co.
Fluidized Bin Bottom.....M. E. Fonda, A. O. Smith Corp.
Phostoxin.....J. W. Gunn, Hollywood Termite Control Co.
Steam Conditioner and Cooling Tower....M. L. Moore, Mid-States Mill Equipment Co.
Dowfume EB-15, Inhibited Spot Fumigant, Non-Corrosive to Mill Machinery.....Dr. Henry Gray, Dow Chemical Co.
Flour Dryer.....J. F. Fischer, Sprout, Waldron & Co., Inc.
Automatic Pneumatic Check Weigher..Henry J. Ousler, Weighing & Control Components, Inc.
Automatic Palletizing Systems.....Don Derricott, Food Machinery & Chemical Corp.

### Wednesday Evening, May 13, 1959

7:00 P.M.—Annual Banquet, Entertainment and Dancing, Ballroom.

### Thursday, May 14, 1959

9:00 A.M.—Drawing for On Time Award. O. C. Spohn, Ismert-Hincke Milling Co., Presiding, Assembly Room.
Application of Fine Grind and Air Separation in Flour Milling .....Ernst Auer, MIAG Northamerica, Inc.
Fundamentals of Fine Grind and Air Separation in Flour Milling .....Dr. W. H. Gellrich, Technical Director Alpine-Lukens Corp.
Panel Discussion—Pneumatic Flour Milling..... F. M. Abbott, G.M.I., Moderator. Panel Members: Bill Katz, Allis-Chalmers; Eric Stanger, Simon-Carter Co.; Fritz Schiess, Buhler Mill Engineering Co.; Ernst Auer, MIAG Northamerica, Inc.; Jack Kice, Kice Metal Products Co.
Panel Discussion—Bulk Handling, Loading and Transportation, George B. Wagner, Director of Sanitation, Pillsbury Co., Moderator. Panel Members: Fred Atkinson, Atkinson Milling Co.; Walter Young, Richardson Scale Co.; V. J. Del Guidice, Armour & Co.; Alden Ackels, General Mills, Inc.; Paul McSpadden, Commander-Larabee; Ted Collier, National Biscuit Co.; R. M. Howard, International Milling Co.; John Gleason, General American Transportation Corp.

12:00 Noon—District Officers, National Executive Committeemen Luncheon. To be followed by Executive Committee and National Officers Meeting.

### LADIES' PROGRAM

### Monday, May 11, 1959

12:00 Noon—Wallace & Tiernan, Inc., Complimentary Luncheon, Assembly Room.

### Tuesday, May 12, 1959

12:00 Noon—Luncheon, Kungsholm Restaurant, Courtesy Sterwin Chemicals Inc. Puppet Opera, Courtesy AOM.

### Wednesday, May 13, 1959

8:30-10:30 A.M.—Buffet Breakfast, Ladies Parlor, Sherman Hotel, Courtesy S. Howes Co., Inc., Silver Creek, N.Y.

Hotel Sherman Exhibit Display on Mezzanine Floor Chicago, Ill.

# AOM TRADE SHOW PREVIEW

## Some of the Things to See

**1—The Day Co.,** Minneapolis, will show a Day "Motivator" at its booth. The "Motivator" is a package unit for high density pneumatic conveying sometimes called fluidizing. The unit shown will be complete with necessary high pressure feeder, positive displacement pump, motors, drives, etc. Day manufactures these units in several different sizes for conveying flour and other materials in various quantities and distances.

**2-4—MIAG Northamerica, Inc.,** Minneapolis, the representative of MIAG, Germany, will show in its exhibit booths the newest model of the all-metal purifier, type 40 dk with double sieve layers, all-metal sieve frames. This machine has recently undergone some minor changes which improved the feeding device in the machine. MIAG also will show a vertical bran finisher No. 356 sm with a built-on drive motor. This bran finisher has some distinct new features. The third item to be shown by MIAG will be the automatic damper No. 50-15, a device which is used to control the water flow into the grain for tempering. This device works automatically, shutting off the water supply when the grain stream is interrupted and returning the water when the grain stream goes through the machine.

**5—Air-O-Flex Equipment Co.,** Minneapolis, expects to have a working model of its new "Hydr-o-Flex" boxcar grain unloader on display; also a picture display of the various sizes, types and models of the "Hydr-o-Flex" semi-trailer truck dumpers, a great many of which are installed in connection with the grain receiving facilities of a flour mill.

**8—Mc Grinding and Corrugating Co.,** Kansas City, will feature its new roll bearings, designed to improve milling and reduce power cost. This new self-aligning shell-type bearing, with independent throw-out eccentrics, eliminates the "floating" action of outside rolls, the firm said.

**10—Kice Metal Products Co.,** Wichita, Kansas, will show pneumatic conveying systems, air-lock feeders and valves, positive displacement blowers, centrifugal "Multi-blowers" and fans, dust collectors and "Spintrifugal" separators, "Multi-aspirators" and classifiers, "Amco" humidifiers, aeration systems and the "Weather-Brain" control. The booth will be staffed by Russ and Jack Kice.

**14—Tol-O-Matic, Inc.,** Minneapolis, will use its booth for discussions of its bale sealer and baler. There will also be a short film available for viewing.

**20—Rolfes Grain Aeration Cos.,** Boone, Iowa, will exhibit the Rolfes "ARO" (automatic digital read-out) temperature scanning instrument; a clear plastic model of a vertical elevator and flat storage which shows how a multi-point temperature scanning system is installed in both of these structures, and small samples of Rolfes aeration duct.

**25—K. I. Willis Corp.,** Moline, Ill., manufacturer of Superior elevator cups, will have a display of elevator cups. The display will consist of its line of elevator cups known as DP—CC—OK and V; manufactured from black steel, galvanized steel, stainless steel and aluminum. The exhibit will also show cups perforated for handling flour and feeds.

**29-30, 37-38—Entoleter Division, Safety Industries, Inc.,** New Haven, Conn., will have the largest exhibit it has ever shown with three special milling machines to be presented. The most important will be the new "Entoleter" ControMil Series 27 designed for fine grinding-by-impact with the counter-rotating rotors. This will be the largest machine ever shown by the Entoleter Division. In addition, the firm will also exhibit a special Direct-Drive Series 27 unit designed to free roller mill surface and increase mill capacities. A small Series 14 "Entoleter" infestation destroyer equipped with a rotor of new design will also be a feature of this exhibit.

**31-36—SMICO,** Oklahoma City, will have on display a SMICO 6 section free swinging sifter, a SMICO 1 section floor mounted operating super sifter, a SMICO 4 section all aluminum construction filter dust collector, and a SMICO No. 60 wheat washer, in addition to other miniatures and samples.

**39—KWAL Paints, Inc.,** Denver, will have displays demonstrating the effectiveness of its paint on concrete surfaces. There will be a display showing how the material, over a concrete surface, will prevent water from penetrating the surface.

**40-41—Thomas Robinson & Son, Ltd.,** will be exhibiting a photographic display featuring the new flour mill which it recently completed in the Philippines for Republic Flour Mills, Inc. This is the first flour mill to be erected in the Philippines, and it includes a number of new features of interest in the field of machinery, conveying and power and control systems.

**42-43—Stephens-Adamson Mfg. Co.,** Aurora, Ill., will exhibit its recently developed continuous weigher and Gravimetric feeder system. Features of the weigher and feeder include: entrance and exit points in line with pivot axis of weigher, eliminating all discharge terminal errors, the firm said; completely enclosed and dust-tight; versatility affording flow rate figures in any unit of measurement; provision of a chart record of flow rate for 24 hr. periods, and recorded total weight from starting to any given moment.

**48—Richardson Scale Co.,** Clifton, N.J., will have an operating grain scale in 1 bu. size, this being a full size machine customarily used for weighing wheat to the first break rolls and being of the same principle and design as used in 10 bu. and 25 bu. size for receiving purposes. Also on display will be the demonstrator unit for the Richardson Select-O-Weigh system, to control the proportioning and blending of any number of grades of flour or feed ingredients. A Richardson G-17 gross weighing

(Turn to **TRADE SHOW**, page 20a)

A. E. BAXTER ENGINEERING CO.
*Designers and Engineers for Mills, Elevators and Feed Mills*
1311-1315 GENESEE BUILDING BUFFALO 2, NEW YORK

"WILLIAMS WAY SERVICE" SETS THE PACE!
Mill Supply Specialists Since 1905
We are specialists in supplying all the expendable items you need for efficient mill operation.

MOST ITEMS IN STOCK
Ready to Ship Same Day
PHONE OR WRITE
☐ Swiss Silk and Nylon Bolting Cloth
☐ Wire Cloth—Tyler
☐ Bindo Edging—for Silk and Wire Sifter Cloths
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Representing SIMON-CARTER CO. and PRATER Lines of Equipment
H. R. WILLIAMS MILL SUPPLY CO.
*Everything for Mill and Elevator*
1320 MAIN STREET Phone Victor 2-3232 KANSAS CITY, MO.

Don S. Eber: "The management certainly has gone out of its way to make us feel at home."

# INCREASE YOUR CAPACITY

# INCREASE YOUR EFFICIENCY

# DECREASE YOUR COST

DIXIE-PORTLAND FLOUR CO.

Pictured above is one of the new 27" Entoleter Centrifugal Impact Mills recently installed at Dixie-Portland. Mr. Cobble, Milling Superintendent, checks one of the new units which requires only 14.8 sq. ft. of floor space.

By using Entoleter® Impact Mills to perform certain milling functions, additional roller mill surface can be made available in any flour mill. This can mean an increase in total mill capacity by as much as twenty percent.

This new and effective application of centrifugal mills for milling of selected streams utilizes a relatively low cost machine which requires a minimum of floor space, power and man hours.

## DIXIE-PORTLAND FLOUR CO. IN CHATTANOOGA, PROVES IT!

F. H. Cobble, Milling Superintendent for Dixie-Portland, has this to say of his new installation of Entoleter Impact Mills: "The Entoleter Mills we installed are doing an excellent job, consistently producing the grind we want. There is no problem of temperature rise. Freeing the roller mills of this step has given us a big jump in total capacity."

*Write Now!* We will be glad to send literature or arrange a visit to discuss this important new concept in grain milling.

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**SAFETY INDUSTRIES, INC.**
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SAFETY RAILWAY SERVICE CORPORATION AUTOMATIC TIMING & CONTROLS, INC.
THE HOWE SCALE COMPANY

# Life and Times of August Kochs Story Of Growth of Victor Chemical Works

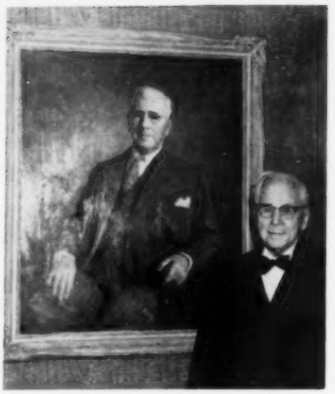
**By Henry S. French**

DELVE into the history of almost any well-established, leading firm, and you are almost sure to find the life and times of a strong, imaginative man of vision intertwined.

Nowhere could this be more true than in the Victor Chemical Works, Chicago, for the influence of August Kochs, present chairman of the corporation, is stamped indelibly throughout this firm's log book since 1897. And, coincidentally, the development of the firm provides a twin story of progress through technology —the advancement of Victor has been synonymous with the growing use of self-rising flour.

Mr. Kochs was 25 years of age when he was assigned in 1897 to look into the prospects for Victor, then a small, unsuccessful subsidiary of a flour concern making monocalcium phosphates for the baking powder manufacturing trade.

Mr. Kochs is not sure whether the tremendous possibilities of the self-rising flour market came to him in a flash of genius, or if it merely evolved. Probably the latter. The concept of pre-leavened, pre-seasoned flour was not new. Monocalcium phosphates were first produced in 1864, and a patent on self-rising flour was issued in 1868. However, it remained for technological developments to make the idea commercially feasible.



**August Kochs, chairman of the board, Victor Chemical Works, Chicago.**

### Early Days

Mr. Kochs remembers his early days at Victor as follows: "I would get to the plant at 6 a.m., wearing work clothing, and help make a supply of monocalcium phosphate in the morning. At noon I changed to business clothes and sold in the afternoon. In the evening I worked in the laboratory to improve the quality."

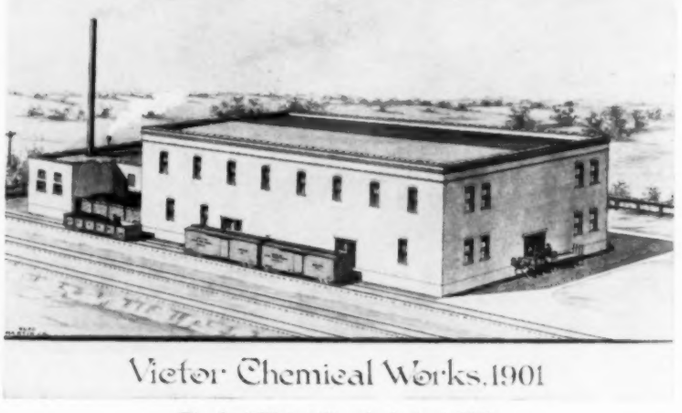
Many hours were spent in the laboratory with George Lloyd, FCS (this means Fellow of the Chemical Society, and is not merely honorary), a chemist brought from England. From the start, Mr. Kochs emphasized product quality, and early in the 1900's was awarded a patent for a process which removed some impurities from phosphates.

**EDITOR'S NOTE: Mr. French is a member of the staff of the Chicago office of this publication.**

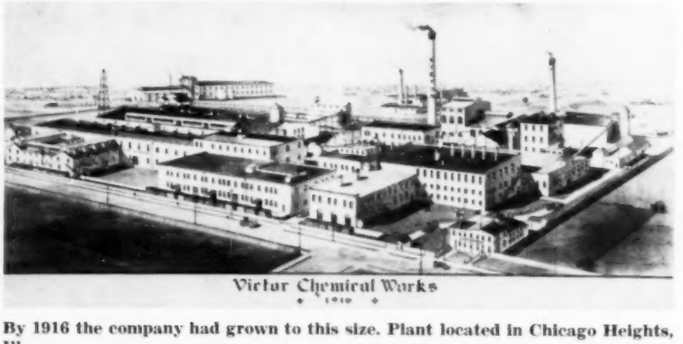
In 1902 plans to secure capitalization for a new plant were begun. At his tender age, Mr. Kochs was entrusted with the responsibility of raising $150,000. He could not do it in Chicago, but finally received the amount from a New York group, and the plant was built in Chicago Heights, a Chicago suburb. Outlets for the firm's products continued to be the baking powder trade, but a growing market in the pancake field was apparent.

### Major Goal Fixed

The major goal, however, now was firmly fixed—the expansion of the self-rising flour field. This market is described in some quarters as "the last frontier in the family flour business with a profit potential for the flour miller." Self-rising flour is said

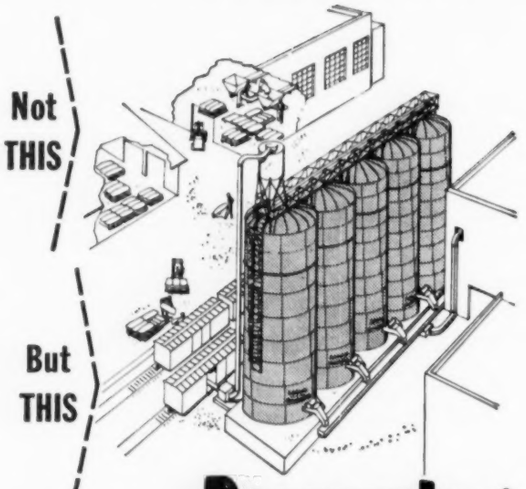



**The first Victor Chemical plant, 1901**




**By 1916 the company had grown to this size. Plant located in Chicago Heights, Ill.**


New way to reduce flour storage costs!

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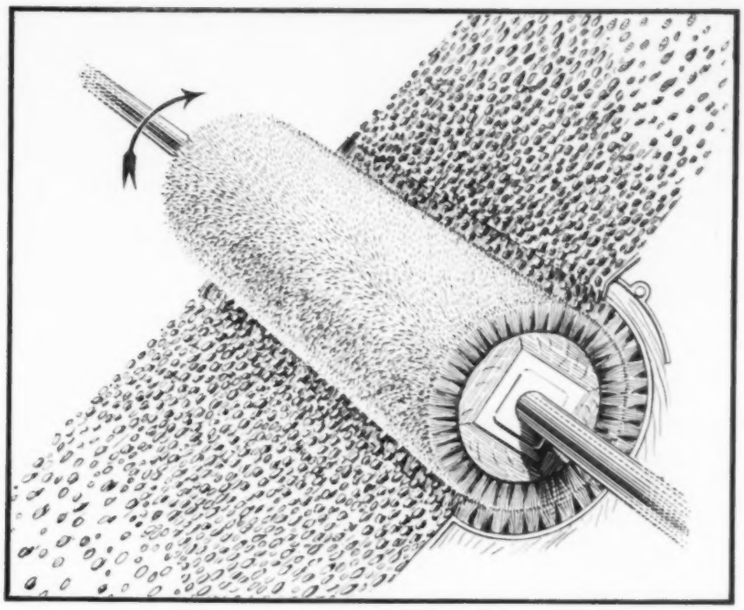
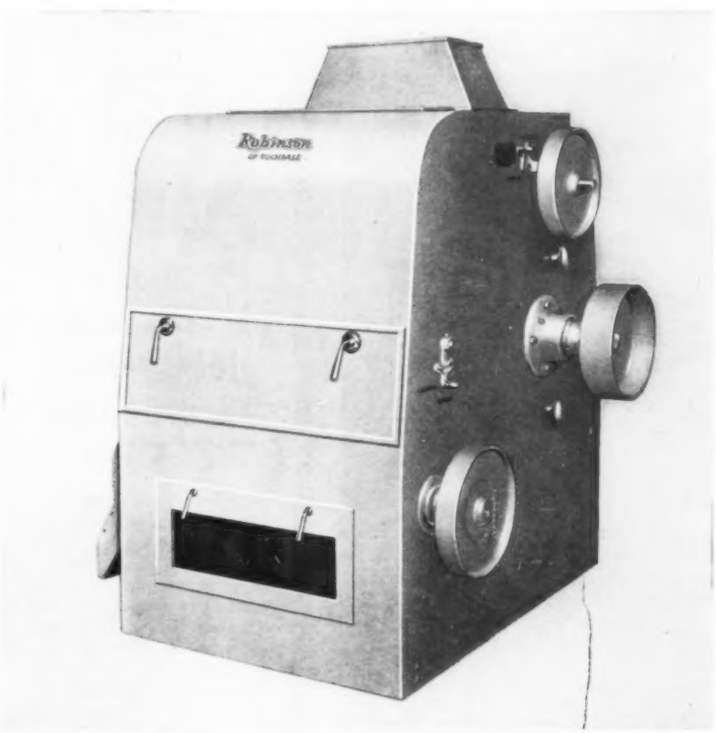
# Every grain individually treated



## Searching cleaning effect of exclusive "brush-to-brush" action

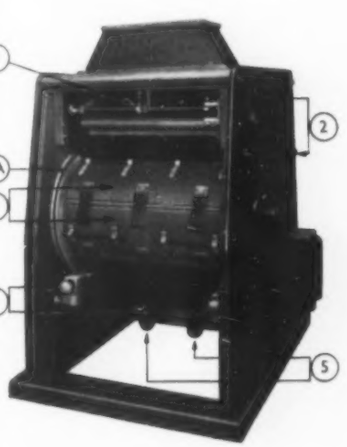
Grain is fed in a thin, even stream (as it would be into the nip of a first break roll) between a stoutly-bristled rotating brush and a stationary brush. The stationary brush is made up of evenly adjustable segments, and wraps round the revolving brush. The result is a most searching and thorough treatment of each individual grain between the bristles, which loosen and remove beeswing, dust and dirt, and ensure that the cleanest possible wheat is fed to the First Break rolls. It is this highly efficient process which has resulted in the improved quality of resultant flours where the Lord Brush is installed.

## THE Robinson LORD BRUSH




- Long life of brushes
- Powerful aspiration on feed and delivery
- Large capacity
- Compact—little floor space required
- Unique method of adjusting stationary brush to wrap round rotating brush
- Automatically balanced feed and delivery gates

1. Swinging feed plate adjustable to flow of stock. May also be fixed.
2. Two powerful aspirations controlled from here.
3. Adjustable segments of outer brush (two visible). Note calibrated scale. (A)
4. Two main controls easily reached and adjusted while machine is in motion.
5. Preloaded delivery gate ensures full-width, even delivery.




**Robinson** *give the miller what he wants*

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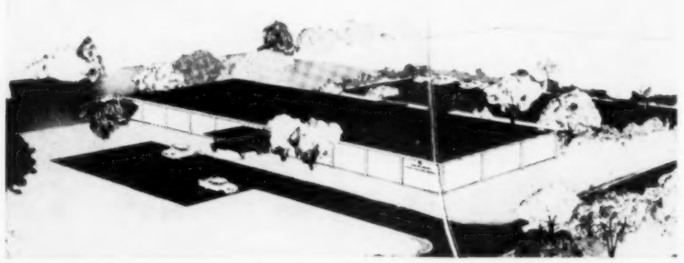
FERGUSON FUMIGANTS

Important members of the Victor team, left to right, are L. E. Jackson, director of the technical service department; E. M. Myers, director of advertising; Rothe Weigel, president; E. Glenn Fite, sales manager, and Morris R. Stanley, vice president and director of sales.

An early test baking laboratory, circa 1929. Pictured are Julian Schlaeger, left, a co-producer on the patent for V-90, and R. A. Barackman, a former president of the American Association of Cereal Chemists. Both men are still with Victor.

By 1946 the baking laboratory had grown to this size. Mr. Barackman again is seen in the background.



In a few weeks research headquarters of the firm will be moved into this new building in Chicago Heights. The baking laboratory will be a part of this building.

to be the "granddaddy" of present bread and cake mixes.

Two big technological bugaboos had to be overcome to broaden the use of self-rising flour: (1) Impurities, and (2) lack of uniformity in neutralizing strength.

Solving problem No. 1 has been a continuing battle, and in doing so long steps have been made in eliminating No. 2. Impurities also weighed against a satisfactory shelf life. By 1910 Victor was the first phosphate producer to comply with the new federal pure food and drug laws.

Mr. Kochs early saw the need for a technical service department. Since the early 1900's Victor has had one, and it is thought to have contributed greatly to the uniform application of the leavening agent to flour by millers. Mills, then and now, may send samples for test-baking free of charge.

By 1908 the plant began to make money, and strides were taken toward removing free phosphoric acid, a major impurity. A plant was built in Nashville in 1921, closer to the source of raw material and the big self-rising flour consuming area. Other steps in the continuous improvement program of monocalcium phosphate are:

1. Production of phosphoric acid in 1929 by the blast furnace method, instead of chemically. This made the product purer and lowered the price.
2. Regent 12 XX was introduced in 1934, a grade of monocalcium phosphate with uniform crystal size to provide free flowing and noncaking properties and the same granulation as flour for easy and uniform blending.
3. An electric furnace was introduced in 1937 in place of the blast furnace operation, eliminating some

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impurities produced in coking methods.

**4.** Dec. 7, 1938, V-90 was introduced. This is said by Victor to revolutionize the whole idea of self-rising flour, and to be the first real change in chemical leavening in 50 years. A real problem through all the years had been the too-fast acting effect of the leavening agent. In the late 1920's, Mr. Kochs is quoted as saying, "Someone is going to find out how to cure this problem, and we had better be the ones to do it."

V-90 is described as an anhydrous, monocalcium phosphate, each crystal possessing a slowly soluble coating. When liquid is added to the flour mixture in the dough making process, it must penetrate the coating and hydrate the interior before any reaction starts with bicarbonate of soda. This gives a retarded and controlled leavening action, yielding oven products of greatly increased volume, lightness and improved eating quality.

Mr. Kochs now is 87 years old, and with the passage of the years has realized the wisdom of welding a strong team to continue the progress of the company. This story was obtained by the interview procedure, with Mr. Kochs and the team sitting around the conference table. All members contributed. They are Rothe Weigel, president; Morris R. Stanley, vice president and director of sales; L. E. Jackson, director of the technical service department; E. Glenn Fite, sales manager, and E. M. Myers, director of advertising.

Due credit is given other commercial firms in the expansion of the family flour field by Victor, as well as to individuals and associations. The forerunner of the present National Soft Wheat Millers Assn., Chicago, was organized in 1922, and the names of J. B. McLemore, Dr. W. H. Stroud, Dr. E. M. Nelson, Dr. Carl Hoppert, and Paul M. Marshall are prominent in the records. The Self-Rising Flour Institute, Nashville, now under the direction of Allen Cornelius, made, and still is making, important contributions. Wallace & Tiernan Inc., Belleville, N.J., with steady improvements in continuous mixing, has been an integral part of the family flour progress story.

From its humble beginnings, Victor has developed into a far flung operation. It now produces more than 150 different chemicals used in a variety of industries, including detergents and soap, foods and beverages, food leavening, water softening and conditioning, petroleum, dentifrices, metal finishing, photography materials, pharmaceuticals, textiles and leather, plastics and agriculture.

In addition to the main office at 155 N. Wacker Drive, Chicago, sales offices are in six cities, warehouses in 10, and manufacturing plants are located at Chicago Heights, Ill.; Nashville and Mt. Pleasant, Tenn.; Morrisville, Pa.; Victor, Fla.; Silver Bow, Mont., and South Gate and Richmond, Cal. Phosphate rock mines and reserves are at Melrose, Mont., and in the vicinity of Mt. Pleasant, Tenn., and vicinity of Hardee County, Fla. The limestone quarry is at Anderson, Tenn.

## Patent Received

ST. LOUIS—Ferguson Fumigants, Inc., recently announced that U.S. Patent No. 2,876,932 had been issued under date of March 10, 1959, to J. Carl Dawson and Leland E. McQuillen, who have assigned the patent to Ferguson. The patent relates to the making, using and selling of what is known in the milling trade as the "Little Squirt Spot Fumigant Applicator," in both the Little Squirt box and the portable Little Squirt machine form.

Little Squirt applicators are in use in the larger flour mills throughout the U.S., and are a part of a system of spot fumigation introduced to the cereal milling industry in recent years. The machine will effectively measure a very small dosage of a highly concentrated fumigant that is introduced into the flour milling system through small, quarter-inch holes bored at strategic points throughout the milling unit, the firm said.

It was developed to solve the problem of measuring the very small, two-ounce or less dosage of Dawson 73 fumigant on which Mr. Dawson had earlier received U.S. Patent No. 2,606,857.

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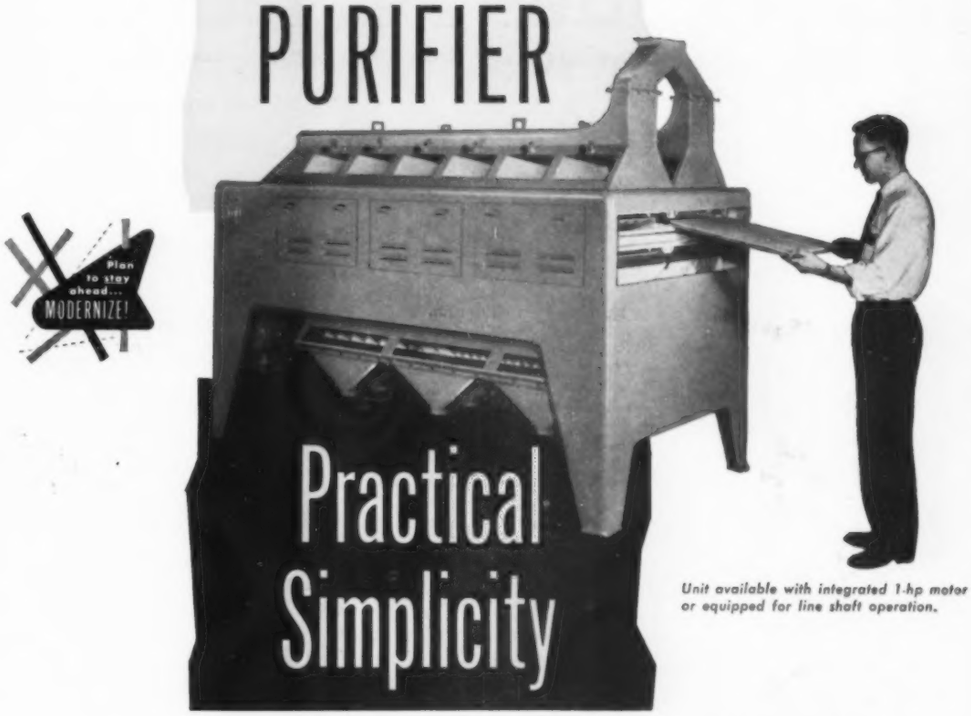


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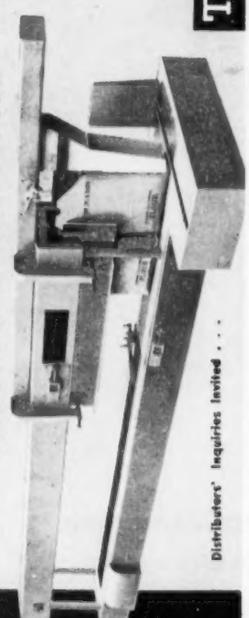

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How To Save 100% OR MORE On Sealing BALER BAGS

# Compaction Tempering—An Innovation In the Milling Industry

**By Theo. Earle**

TABLE #1

HIGH EXTRACTION WORK BY DOTY LABORATORIES

| | | % Wingoff | % Total Flour | % Patent Flour | % Ash-Patent Flour | % Protein Patent Flour | % Low Grade Flour | % Clear Flour | % Total Bran | Flour Color | Loaf Volume cc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Montana Spring | None | 79.5 | 51.0 | 0.48 | --- | 8.5 | 20.0 | 20.2 | -- | | Control |
| 5 | " | 4.55 | 76.5 | 70.1 | 0.51 | 13.9 | 1.9 | 3.36 | 18.0 | 100 | 710 | |
| 8 | " | 3.25 | 81.3 | 74.1 | 0.48 | 13.95 | 4.92 | 2.36 | 18.2 | 101 | 720 | |
| 25 | " | 2.72 | 81.06 | 73.32 | 0.47 | 13.07 | 2.84 | 5.91 | 17.82 | 106 | - | |
| 14 | Turkey Red | 2.71 | 80.35 | 70.92 | 0.455 | 11.86 | 3.93 | 5.5 | 19.63 | 108 | 770 | |
| 11 | Montana Marquis | 2.82 | 78.0 | 70.96 | 0.463 | 11.65 | 2.15 | 4.89 | 21.96 | 108 | 760 | |
| 12 | Soft White Wheat | 2.82 | 78.52 | 71.92 | 0.447 | 14.0 | 2.16 | 4.92 | 20.98 | 112 | 710 | |

Mill Run - Normal Extraction
Assays by Mill

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hard Winter Wheat | 2.2 | 71.6 | 66.3 | 0.45 | 12.5 | -- | -- | 28.4 | - | - | |
| " | None | 69.4 | 62.8 | 0.46 | 12.4 | -- | -- | 30.4 | - | - | Control |

THIS article describes a new process for improving flour grade and increasing patent flour as a result of compaction tempering. This is accomplished by first removing the epidermal bran coat from wheat or rye (hereinafter called "wing" or "beeswing,") which in the past was thought by millers to hold the lower bran coats together and prevent powdering in the mill. The opposite now appears to be the fact; from all angles the wing is harmful, and the sugars in the underbran coats, properly treated, are responsible instead. Beeswing is more friable than the underbran coats and tends to break up in the rolls; it raises the ash content of flour, carries dirt, insect eggs and other extraneous matter all of which cannot be removed from its surface by washing. While it is only approximately 3% of the berry by weight, it runs 22% fiber, 3% ash and 55.8% cellulose; has practically no value in human nutrition (see Table No. 3) and dilutes the whole recovery by a significant percentage. The problem therefore was to remove this wing before the actual milling.

The original impetus for this work was to produce more edible and tasty grain products,[1] (for all the bitterness is contained in the wing with its gums and resins, as well as scratchy cellulose) and by a method that would overcome the problems involved in other known methods of cleaning grain, or pre-treating it. As experiments and investigations proceeded, more important results from wing removal became apparent and provided the stimulus for continuing work on normal and long recovery flours.

## Method Described

The method described below is a "dry" process, and the term "stripping" is used to differentiate it from the various "wet" methods of "peeling."[2] Where chemicals were added in peeling off the wing, the loss of 3% in weight was a serious cost factor. Stripping needs no chemicals and no later drying out. The beeswing, as it comes from the stripper can be remixed with the bran stream from flour milling for the usual feed purposes, if desired, or reserved for potentials such as plastics, acoustic materials, acid fertilizers, or as yet unforeseen commodities. Stripping[3] loses none of the water-soluble sugars or proteins contained in the lower bran layers, which are so necessary to prevent powdering of these layers, thus diluting the white flour.

The first problem was to remove the wing economically, and the second, to toughen the bran remaining after the epidermal coat was stripped off so that the grain could be given a more harsh milling by the rolls and thus rub off more flour. During the preliminary testing of wing removal

TABLE #2
(By Doty Laboratories)

| Montana Spring Wheat | Untreated Wheat | Stripped Wheat |
|---|---|---|
| Protein | 15.50 | 15.40 |
| Moisture | 11.70 | 12.80 |
| Milling Properties | V. good | V. good |

Long Extraction Yield

| | | |
|---|---|---|
| Bran | 155 grams | 130 grams |
| Shorts | 60 grams | 55 grams |
| Low Grade | 85 grams | 33 grams |
| Clears | 200 grams | 60 grams |
| Patent | 510 grams | 740 grams |
| Total Flour | 795 grams | 833 grams |

Bran and Shorts Analyses

| | Moisture | Ash | Fiber | Carbohydrates | Fat | Protein |
|---|---|---|---|---|---|---|
| Untreated Bran | 13.00 | 5.79 | 12.10 | 60.61 | 3.20 | 17.40 |
| Untreated Shorts | 13.10 | 3.42 | 6.20 | 62.43 | 4.15 | 16.90 |
| Stripped Bran | 13.00 | 6.16 | 10.90 | 57.94 | 3.45 | 19.45 |
| Stripped Shorts | 12.60 | 5.00 | 6.50 | 58.25 | 5.10 | 19.05 |

| | Thiamine | Riboflavin | Sugars* |
|---|---|---|---|
| Untreated Bran | 3.07 mg./lb. | 1.20 mg./lb. | 5.54 |
| Untreated Shorts | 3.45 mg./lb. | 1.14 mg./lb. | 6.82 |
| Stripped Bran | 3.00 mg./lb. | 1.07 mg/lb. | 6.08 |
| Stripped Shorts | 2.37 mg./lb. | .96 mg./lb. | 7.92 |

* Total Sugar as Invert

**EDITOR'S NOTE: Mr. Earle, who makes his headquarters in Pacific Palisades, Cal., is an engineer who has done considerable research work on wheat. In essence, his article is an answer to one entitled "Observations on Cleaning Wheat" that appeared in this publication in June of last year. The author was Harry L. Donovan, executive vice president, Anaconda Industrial e Agricola de Cereais S.A., Sao Paulo, Brazil. Mr. Donovan deplored the condition of grain as it goes to the mills and made a plea for simpler, less complicated and less costly flour mills.**

it was found that even the slight pressures needed to strip as little as 2% wing gave a white flour recovery which could not be accounted for by the loss of the wing alone; as greater pressures were applied in the stripper, more wing was removed and higher extractions were made with better flour.[4] This could mean only that the under-bran layers were being compacted and compressed during the stripping, and thus toughened beyond anything now being done to them either by present water tempering or other means. The bran compaction and toughening is very similar to the action of the earth-compaction machine known as a "sheepsfoot packer." This machine works on moist earth and, with its weight put on many small sheepsfoot-like projections and passing over the same place many times as it rolls, it so compacts the earth that it becomes much harder than the original dirt.

### Many Machines Tried

During the years, many types of flour, rice and ore-milling machines were tried for stripping, and it was thought best to concentrate on modified rice mill of standard design; inexpensive, occupying a minimal amount of floor space, low power requirements, and negligible operating costs.[5] A pilot plant now operating in one of the larger flour mills can produce three tons per hour continuously, and needed only minor mechanical changes to get it running satisfactorily. Once set, no other changes were necessary to treat any kind of wheat or rye, or both together.

This report deals primarily with the effects of stripping and compaction tempering, rather than its detailed operation (which data should be given when an individual mill problem is better known). However, the procedure is roughly as follows: the mill-cleaned grain goes to a screw conveyor where the proper amount of water is sprayed upon it. The moistened grain stands a short time to allow the sugars in the lower bran coats to soften, and to be loosened from the wing.

It then goes to the stripper. This machine is kept full at all times. Because of the hard rubbing caused by the rotating and forward movement of grain against grain, much of the wing removal is in the first part of the machine. As the partially denuded grain passes through, all of its surfaces are under constant rolling and tumbling pressures with other grains, and thus these pressures on the softened under-bran coats compact them throughout. The loosened wing is then removed by aspiration. It contains about 35-40% of the added water used for stripping, but is still rather soft and fluffy as it comes out. After the strip more water can be added for further regular tempering for the treated bran retains its toughened condition and new characteristics. It then either stands for an hour before polishing, if for white flour, or passes directly to the polisher if for "whole wheat." When used for white flour, the short standing time between stripping and polishing is beneficial in that any excess moisture sinks into the grains and the loosened particles of wing can be rubbed off in the polisher without harming the sugars, which have now hardened again. As a general rule, one polisher will handle the grain from two strippers, and they are similar machines. The amount of wing removal can be controlled by the amount of water added, the time of standing in contact, the speed of the machine, and the discharge opening.

During the dry strip testing it was noticed that the grain had a very different finished appearance from grain that had been peeled. Samples of many stripped wheats were sent to various laboratories for comparative normal recovery flour testing. In every case reports showed that considerable improvement was being made in amount of patent flour, and grades. Tests were then run on high extraction flours with still more encouraging results. Different stripping mill conditions and operations were tried until good over-all results were obtained under every test and on all wheats tried. Table No. 1 indicates (1) long extraction results on a few of the different stripped wheats and one control test; in sample No. 5 it also shows the effect of too much wing and sugar removal; (2) a mill run on normal recovery flour and its control test. Table No. 2 gives a comparative analysis between plain bran and shorts as against that made after stripping, from a duplicate test similar to No. 8. Bran made as part of the stripped white flour milling is different from any used now. It is sweet to the taste, as indicated in the sugar difference. But the lack of wing is still more important to the improved taste. Similarly, flavor is bettered for "whole wheat" or "whole rye" products, in addition to the improvement in lowered fiber.[6] (See Table No. 4.)

In summary, some of the important advantages of pre-stripping grain are as follows:

#### TO THE MILLER

1. Eight-ten percent more patent flour per ton of grain, where higher


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extraction is desired.

**2.** Removal of wing so brittle and friable that some would otherwise be ground into the white flour; most of the remaining dirt and beard removed from washed or mill-cleaned grain.

**3.** Lower ash, so better price.

**4.** At least 3% less quantity (by weight) to be put through the mill.

**5.** Makes screening out the wing unnecessary.

**6.** Germ and all natural vitamins intact; percentage of riboflavin and thiamine increased in the patent flour.

**7.** Simpler milling; no washing operation, less cleaning of screens, a saving of wear on roll corrugations.

**8.** Operating costs are negligible.

**9.** Installation costs of machinery very low.

**10.** Minimum of floor space required.

**11.** Can be run in batches or continuously.

**12.** Flour keeps well in storage.

**13.** Any kind of wheat or rye may be stripped singly or simultaneously without changing the mill.

**14.** Allows for better quality bran products; bran that is good for human consumption should bring a better price than for cattle food.

TABLE #3

(By Doty Laboratories)

| Analysis of WING 3.25% | | Vitamine anal. of Patent Flours | |
|---|---|---|---|
| | | No wing removal | 3.25% wing off |
| | | Normal Extraction 59.2% patent | Long Extraction 74.01% patent |
| % fat | 1.10 | | |
| % fiber | 22.05 | | |
| % ash | 2.45 | | |
| % moisture | 12.30 | | |
| Thiamine mg/lb | 0.25 | 0.49 | 0.51 |
| Riboflavin mg/lb | 0.83 | 0.09 | 0.10 |
| % cellulose (dry) | 55.8 | | |

TABLE #4

"Whole" Wheat Flour

(By Doty Laboratories)

| | % Wingoff | % Ash | % Protein | % Crude Fiber | Loaf Characterists |
|---|---|---|---|---|---|
| Mont. Winter Wheat | - | 1.65 | 15.2 | 3.33 | Control |
| " | 2.8 | 1.45 | 15.9 | 1.25 | Lighter Color - Better Flavor |
| Hard red wheat | - | 1.54 | 15.4 | 2.21 | Control |
| " | 2.7 | 1.53 | 15.8 | 1.38 | Lighter Color - Less Harsh - Better Flavor |

**TO THE BAKER**

**1.** Makes better loaf appearance in lighter color, better body and fine texture.

**2.** Lower ash.

**3.** Cellulose and scratchy substances greatly reduced, with better rising results.

**4.** For "whole grain" flour a genuine nutty and sweet flavor due to the presence of the germ, and no sugar loss.

**5.** No need for enrichment; all vitamins remain in the "whole wheat" flour, and vitamins and proteins are increased in white flour.

**6.** No need for strong, artificial flavors; all bitterness has been removed in the beeswing.

**7.** No changes in formula necessary.

**8.** Any or all pre-stripped milled grains and their products can be recombined to make new products without loss of improved taste or texture.

Dry-stripping has overcome the cost and operational problems involved in other known methods of cleaning or pre-treating grain. Further, and more important, its compaction tempering results in a highly improved flour grade, and an appreciable increase in patent flour recovery.

It is in essence, an answer to Harry L. Donovan's (of Brazil) article "Observations on Cleaning Wheat" that appeared in this publication in June, 1958, wherein he (1) deplores the condition of grain throughout the world as it goes to the mills; and (2) implores "simpler, less complicated and less costly flour mills."

1. Wing is well recognized by the medical profession as the culprit irritating to human intestines. Whole grains as they now exist are banned in the treatment of ulcers and abdominal distresses.

2. No peeling processes now in use have been found entirely satisfactory for whole grain products, or satisfactory at all for white flour, in that due to long immersion, high heat was necessary to dry the grain to the proper total moisture, and underbran coats shrank by loss of water-soluble properties, becoming exceedingly brittle.

3. U.S. Patent published Jan. 6, 1959, No. 2,867,256; supplementary patents applied for as well as foreign patents, including Canada.

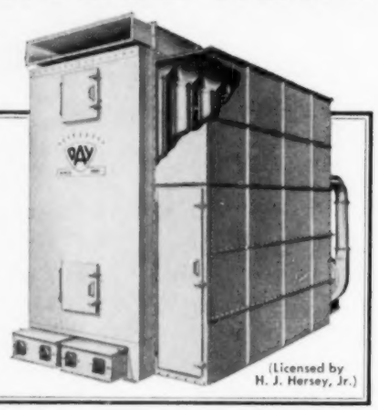
4. Experiments in the amount of wing removal most desirable without lowering milling efficiency, showed a range from 2.7% to 4.55%, with 3% to 3.25% proving to be the optimum. (See Table No. 1.)

5. One man per shift of eight hours can handle 150 to 200 tons; the operational cost of the actual stripping is below 20¢ a ton, and that, plus low machinery installation costs is easily offset by the 3% reduction in milling.

6. All laboratory tests made by Doty Laboratories, North Kansas City, Mo.


DAY

DUST CONTROL NEWS



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# Practical Applications of Ionizing Radiations of Food May Come Soon

ROME—Studies on the treatment of some foodstuffs with relatively low dosages of ionizing radiations have advanced in Europe to a point where some practical applications of the method may be developed in the reasonably near future provided that the wholesomeness of the treated food has been assured.

A report completed by the Food and Agriculture Organization (FAO) says, in guarded and qualified language, that impressive progress has been made in the past few years in laboratory use of radiations in extending the storage life of foods and in killing undesirable organisms in food.

### Summary of Meeting

The report is a summary of the European meeting on the use of ionizing radiations for food preservation, held last November at the U.K. Atomic Energy Authority's Atomic Energy Research Establishment at Harwell. It was attended by 176 representatives of 17 European members of FAO, and by 22 observers from five non-European members and 14 international organizations.

On the basis of review papers presented by invited specialists from European countries and the U.S., the meeting surveyed the present status of food irradiation, evaluated the technique's potential for European countries and considered the need for and possibilities of organizing international cooperation in research.

The report warns that many basic problems remain to be solved before radiation treatment of foods for the extension of their storage life will be ready for widespread development and application. But, it points out, "a few possible applications of irradiation, such as the inactivation of Salmonella in egg products and of certain parasites in meat, the disinfestation of grain and certain packaged products, and the suppression of sprouting in potatoes and root crops, are approaching the stage at which commercial exploitation might be considered, provided that the wholesomeness of the treated foods had been assured."

Food irradiation was still in the stage of laboratory research in Europe but plans under way in the U.S. for pilot and demonstration plants "reflect confidence in the process."

Present indications were that treatments involving the use of substerilizating doses of radiation, rather than the higher sterilizing doses, were "more likely to lead to practical applications in the reasonably near future."

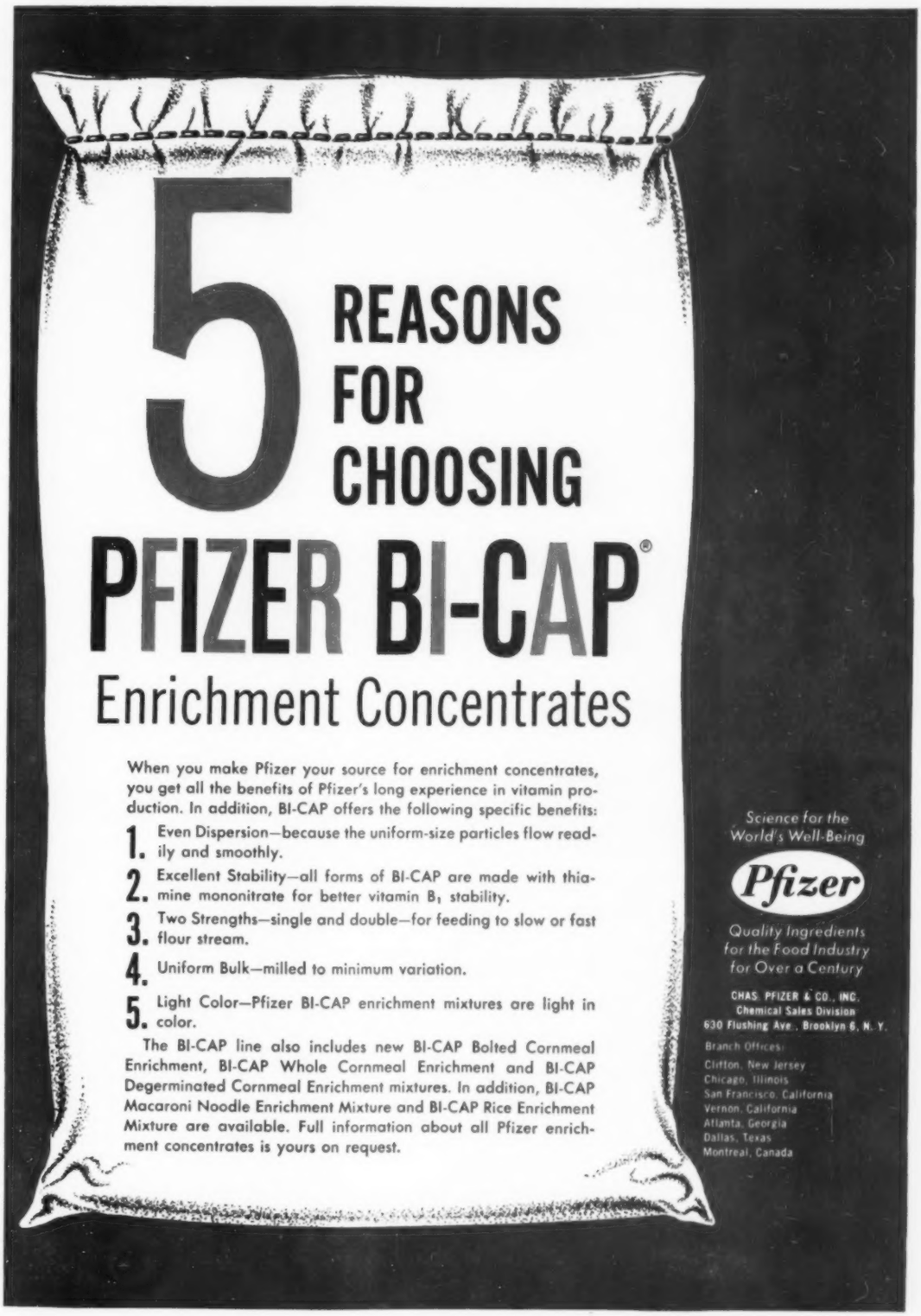
### Treatments Feasible

Low-dose treatments had been found feasible, such as the suppression of sprouting in potatoes and root crops, the reproductive sterilization of insects in stored grain and some packaged products, and killing certain parasites in meat. Treatment with moderate doses had produced a five fold increase in the storage life of certain meats and meat products, fish, and some fruits and vegetables. The food poisoning organism Salmonella, frequently found in egg products, had been successfully killed in frozen whole egg pulp. The irradiation process, the report says, performs its work without appreciably raising the temperature and thereby cooking foods, and the product need not be removed from its package.

Treatment with higher doses, intended to give a sterile food in which no microbial spoilage is possible produced changes in color, flavor, odor and texture which were considered objectionable. This problem would have to be solved before such treatments were likely to be used on a wide scale.

The meeting agreed that the potential value of food irradiation as a method of preservation "justified considerable investment in research." It recommended that European governments encourage and support such research, and that appropriate forms of international cooperation in this research be established to reduce its cost. It asked that FAO establish a permanent technical working group on food irradiation to review developments in the field, and that organization set up such other technical groups as will be necessary to study the problem of formulating fundamental principles governing the use of irradiation and methods of testing irradiated foods for wholesomeness; the aim would be to evolve a common basis for legislation on the subject in individual countries, other such technical groups might be formed to study microbiological and entomological aspects of food irradiation.

Chairman of the Harwell meeting was Dr. Norman C. Wright, at that time chief scientific adviser (food) of the U.K. Ministry of Agriculture, Fisheries and Food, and now deputy director-general of FAO.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# New Methods to Detect and Eliminate Insect-Infested Grain

**By Max Milner**
**Kansas State College**

EMPHASIS on the sanitary status of cereal foods in the U.S. in terms of freedom from insect and rodent contamination has prompted the development of methods for inspecting commercial grain for internal or so called "hidden" infestation as well as the development of practical means to remove infested kernels from bulk grain. Much of this work is so recent that the potentialities of many of the techniques proposed have not been adequately explored by the grain marketing and processing industries for which they have been designed. Nevertheless, adequate and reliable means for the detection of infestation in grain appear to be available, whether the requirement is for rapid preliminary screening test at the point at which grain first enters commercial channels in a country elevator, or whether the need is for a virtually quantitative and objective evaluation which permits greater complexity in cost.

Individuals experienced in the practical arts of evaluating the commercial quality of grain can ascertain a great deal about its infestation status by rapid visual inspection alone. On the basis of an extensive program of sampling and examining commercial grain, the Food & Drug Administration suggested that counts of insect exit holes in 100 gram samples provide a rapid infestation sorting procedure. Insect holes in more than three kernels indicate the sample to be excessively infested. Mechanical adjuncts can be used to speed up this test.

## Long Used Test

The so-called "cracking-flotation" test has long been used in cereal industries to determine the internal insect content of infested grains. Insects, insect heads, and insect cast skins are released from infested grains by coarse grinding. Flotation-separation and concentration of insect material from an alcoholic solution by means of mineral solvents then permits microscopic examination and identification. Although the technique is objective, it is complicated and laborious, requiring the facilities of a laboratory as well as considerable experience and skill on the part of the technician in identifying the insect materials.

The earliest attempts to meet the needs of cereal processors for a quick preliminary indication of infestation involved the use of stains which make visible the gelatinous weevil egg plug secreted by the female to cover the egg cavity. Thus the stored products insects group at the U.S. Department of Agriculture proposed the use of acid fuchsin, a dye which stains egg plugs a cherry red but which does not affect the bran coat. Iodine solutions are also useful for this purpose. One drawback to this test is that endosperm exposed by mechanical damage or insect feeding is also stained by these coloring agents, and considerable experience is necessary to differentiate between infested and superficially damaged kernels. The group at Kansas State College proposed the use of a water soluble fluorescent dye, berberine sulfate. This dye appears to stain only the insect egg plugs and does not affect the grain constituents.

A major criticism of all egg plug staining tests is that they yield no knowledge of the stage of insect development within the kernels. Furthermore, they are useful for detecting only rice or granary weevil infestation. They are at best only preliminary indicators of the internal infestation status of grain.

In England a simple gas analyzer is used to provide a routine measurement of total biological activity in stored grain. Living infestation is estimated from the carbon dioxide production in grain samples.

## Proposals Made

A sectioning procedure to uncover internal infestation invisible was proposed by the University of Wichita.

**EDITOR'S NOTE: This is a summary of a chapter with the same title by Prof. Milner appearing in Volume 8 of Advances of Food Research which was published in 1958 by Academic Press, Inc., New York.**

Inspection of sectioned kernels under ultraviolet light facilitates location of material of insect origin. No general application of this procedure has developed.

A chemical method for detecting insect material based on spectrophotometric analysis for the concentration for a hydroxyphenol occurring in insect cuticle has been proposed. Only preliminary work has been done in this promising area.

Considerable effort has been made to develop inspection methods for internal infestation based on differences in density between sound and internally infested kernels. One such procedure employs solutions of sodium silicate with gradations of specific gravity in order to separate infested kernels by flotation methods. The use of air blast to separate infested from sound kernels has also been proposed. A seed blowing device can be adapted to provide a reasonably quantitative segregation of wheat kernels containing exit holes, thus reducing by a factor of 10 or better the number of kernels in a given sample which must be examined. This method seems best when employed in conjunction with the exit hole inspection procedure previously described.

The most objective method developed so far, and at present widely used for examining grain for internal infestation, is that of x-ray radiography. This application developed at K-State utilizes softer radiations than those of normal radiographic technique and thus require x-ray tubes with beryllium rather than glass windows. Voltages between 15 and 30 kilovolts are most effective. This procedure is also used to detect cracking in artificially dried corn as well as in rice, and it has other applications to cereal processing. Polaroid land photographic media have been applied as adjuncts to x-ray inspection of grains, thus eliminating the need for dark room processing of films. Under development recently has been an electronic detection method whereby insect sounds can be picked up and amplified sufficiently for monitoring purposes.

Separation of internally infested kernels from sound grain cannot be accomplished readily by traditional grain cleaning machines. It may be

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effected to a considerable degree, however, by means of a new device known as a grain spectrometer which projects a stream of grain into air with consequent separation of kernels on the basis of physical differences. This permits segregation of infested fractions.

The insect fragment problem in flour milling has been minimized by pre-breaking of cleaned wheat followed by aspiration to remove insect fragments and inspect parts released by such treatment.

Inspection of flour and other cereal products for insect fragments whereby results are expressed in terms of "insect fragments per pound" is misleading in terms of the quantity of insect material actually present. A calculation of insect material on a parts per million basis suggests that, on the whole, baker's flours are at this time remarkably low in insect matter, and that the expression "insect fragments per pound" provides a false notion of the status of insect contamination in such foods. For this reason methods are needed for more precise and objective analysis of insect contamination in flour and similar foods.

——BREAD IS THE STAFF OF LIFE——

## Allis-Chalmers Reports Improved Earnings

MILWAUKEE — Sales for Allis-Chalmers Manufacturing Co. in 1958 were $531,972,829 as compared with $534,146,214 in 1957. Net earnings after preferred stock dividend requirements for 1958 amounted to $19,235,127 or $2.34 per share of common stock as compared with $17,353,653 or $2.11 in 1957.

Results from Canadian Allis-Chalmers are reflected in the consolidated statement for the first time in 1958. If the 1958 sales of Canadian Allis-Chalmers—consolidated in these accounts—were deducted, sales would have been 2% lower than in 1957.

Dividends paid on common stock for the year 1958 amounted to $10,270,016. On the outstanding preferred stock $422,831 was paid making a total of $10,692,847 in dividends for the year.

Results for 1958 and 1957:

| | 1958 | 1957 |
|---|---|---|
| Net sales billed | $531,972,829 | $534,146,214 |
| Earnings for year | 19,657,958 | 17,819,251 |
| Less preferred dividend requirements | 422,831 | 465,598 |
| Earnings available for common stock | 19,235,127 | 17,353,653 |
| Earnings per share of common stock | 2.34 | 2.11 |
| Number of shares of common stock | 8,216,016 | 8,214,281 |
| Total assets | 468,640,772 | 473,641,701 |
| Number of employees | 32,364 | 35,799 |

Fourth quarter sales billed in 1958 amounted to $138,223,975 of which $10.3 million represents the net consolidation of Canadian Allis-Chalmers operations for 1958. Fourth quarter sales in 1957 amounted to $114,791,700.

Earnings for the fourth quarter of the year after deducting preferred dividends for the quarter amounted to $5,906,233 equal to 72¢ per share of common stock as compared with $2,833,404 or 35¢ per share in 1957. Preferred stock dividend requirements for the fourth quarter, 1958, were $105,708 as compared with $105,952 the previous year.

——BREAD IS THE STAFF OF LIFE——

### ADDITIONAL CONSTRUCTION

HARTMAN, COLO.—Additional construction at the Des Marteau elevator here has started for eight new tanks which will add another 90,000 bu. capacity to the present elevator at a cost of approximately $75,000. Total storage available when the construction is completed about May 15 will be 150,000 bu.

## 33-Year-Old Wheat Makes Good Bread

FORT COLLINS, COLO.—A cooperative U.S. Department of Agriculture-Colorado State University research project has shown that bread made from wheat stored up to 33 years can still be pretty fair eating.

Tests showed thiamine and protein content of such bread was comparable to that made from freshly harvested wheat. Cooperating in making the tests were Dr. D. W. Robertson, chief agronomist with the CSU station, and C. C. Fifield, baking technologist with USDA's Agricultural Research Service.

They found that quality of bread made recently from the stored wheat samples was in most cases the same as for bread made in earlier tests. In a few instances, loaves from old wheat did not rise as much. Texture of crumb and grain scores generally showed a decline in quality compared with earlier years.

But storage had no significant effect on protein content and thiamine values were the same for the stored as for freshly harvested wheat.

A definite and fairly regular increase in fat acidity during storage was noted, indicating a certain amount of progressive deterioration. But this was not as apparent in baking tests as might be expected.

Findings were based on analysis for nitrogen and thiamine content and on baking tests of wheat samples and flour made from them. Wheat samples were stored beginning with the 1921 crop, and tests were made periodically over the past 20 years. Another series of tests is planned, possibly in the early 1960's.


**The Arithmetic of Materials Handling**

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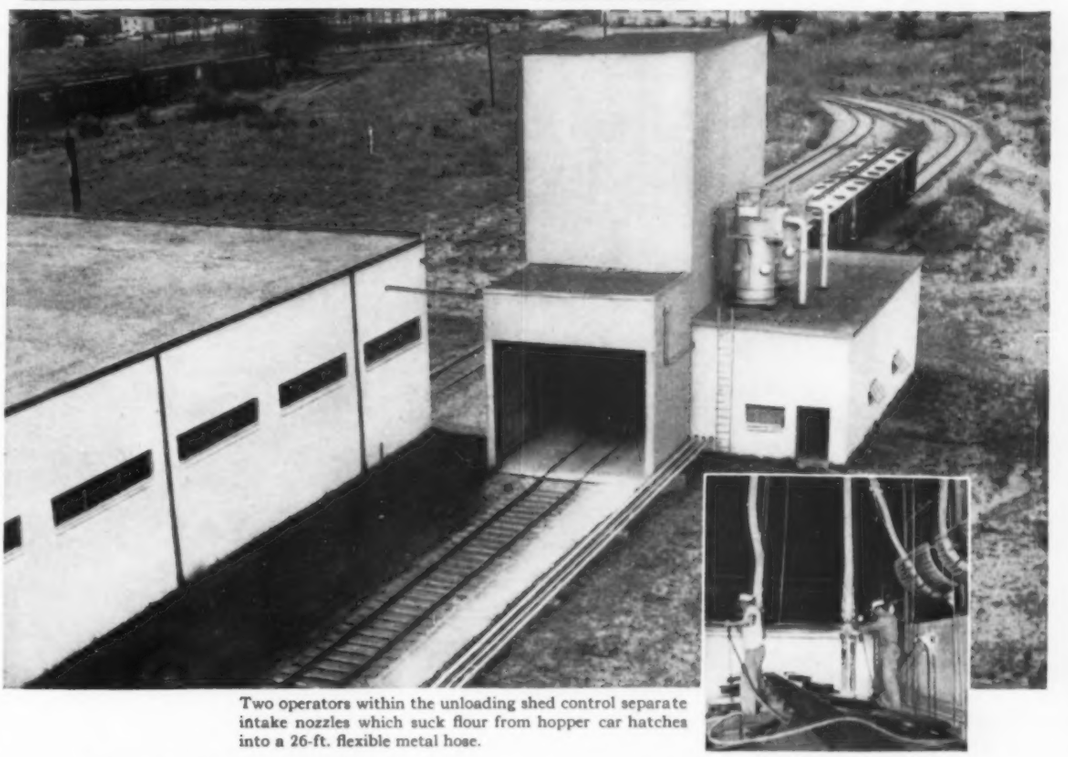

Two operators within the unloading shed control separate intake nozzles which suck flour from hopper car hatches into a 26-ft. flexible metal hose.

**Flexibility of FULLER Pneumatic Conveying Systems Makes Problem Plant Site Practical For General Mills**

The proposed site of a new General Mills flour blending and packaging plant in Louisville, Ky. seemed impractical to mill engineers because of the site's long, narrow shape. Flour, delivered at a dead-end rail siding, would have to be conveyed over unusually long distances—400 feet from unloading point to storage bins.

By incorporating Fuller Airveyor® pneumatic conveying systems in the plant design, General Mills has overcome these disadvantages and has completed one of the country's most modern bulk flour handling plants.

At the new, highly-automated plant, Fuller Airveyors unload Airslide® or hopper cars of bulk flour at 40 tons an hour, flowing it 400 feet to a series of 18 silos. In a completely integrated system, other Fuller Airveyors deliver ingredients for blending, weighing, proportioning and bagging operations. The compact, 5-inch pneumatic pipelines twist and turn easily through what would be cramped or impossible quarters for other methods of conveying. Self-cleaning Airveyors, containing few moving parts, practically eliminate maintenance and industrial hazards.

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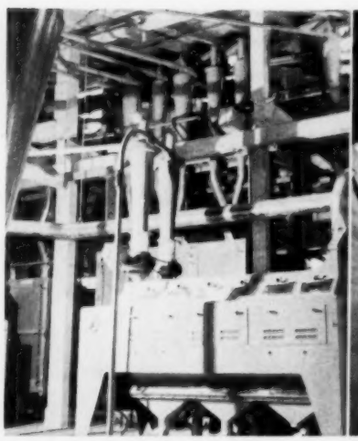
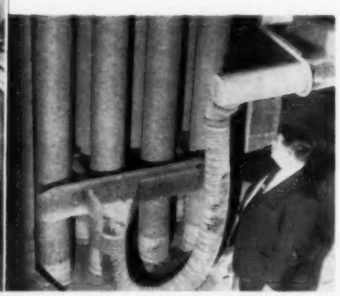
# *Pneumatic System Installed . . .*

WILLIAMS MILLING CO., Quincy, Mich., has put into operation the first Allis-Chalmers Mfg. Co. high pressure pneumatic flour mill conveying system. The newly-designed system, which at the Williams mill includes 28 separate lifts from a single plenum, is neater and cleaner, requires less space for pneumatic piping and sharply reduces dust contamination of room air due to over-all tightness, Allis-Chalmers said. As a related part of its modernization program, Williams installed two new double deck purifiers that were recently introduced to the milling industry by Allis-Chalmers.

★ ★ ★

Here is the Williams Milling Co., Quincy, Mich., which recently put a new high pressure pneumatic conveying system into operation. The grain storage tanks are shown behind the warehouse and office.





Left, the installation at Williams Milling is neat and compact. Feed to the double deck purifier is through twin primary collectors and rotary feed valves, permitting simultaneous flow of two separate stocks. Center, prefabricated components are used for the downspouting of the mill stocks. John Williams, plant manager, left, and Charles Batman, superintendent, inspect a sample of the stock. Right, in front of the Day filter, Herbert Vanderlip, engineer-in-charge of food processing and chemical equipment for Allis-Chalmers, inspects the reverse jet cleaning ring. It was pointed out that up to six product classifications are possible with the new purifier.

Mr. Batman adjusts control which limits air available to each cloth area of the purifier's sectionalized decks. Looking on are Warren Williams, president of the firm, left, and Clyde Williams.

John Williams and Mr. Vanderlip observe one middlings stock between second and third floor.

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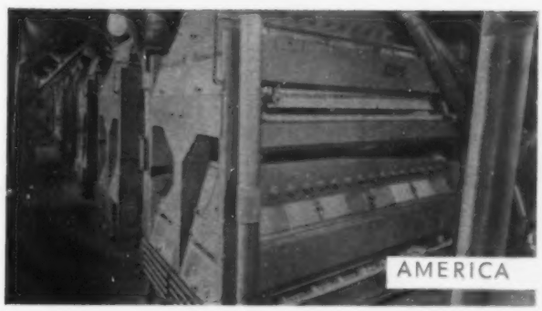
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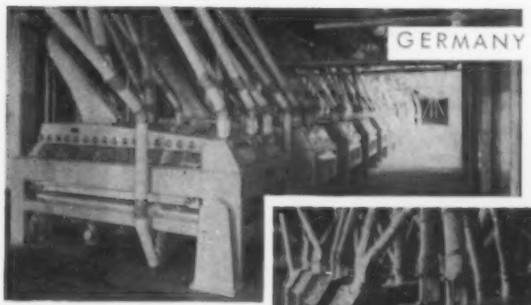
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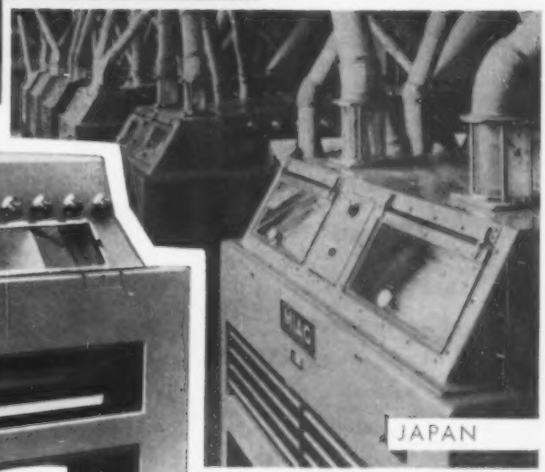
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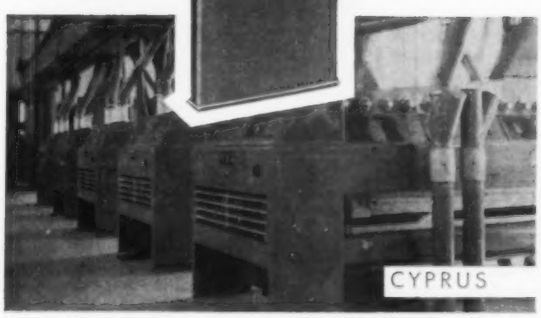
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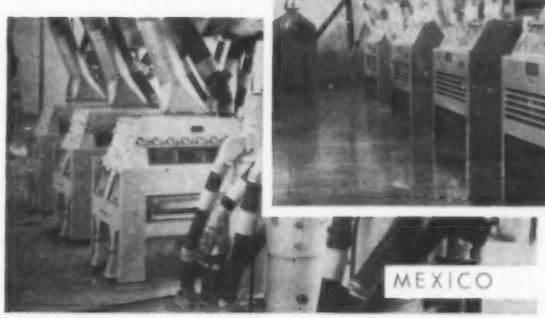
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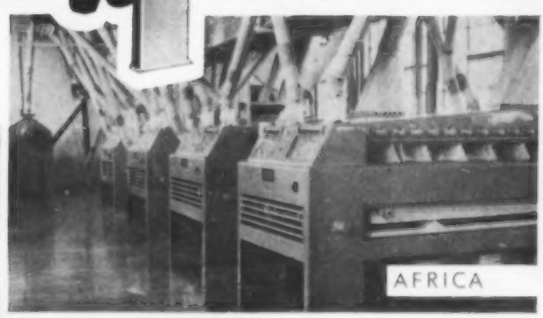
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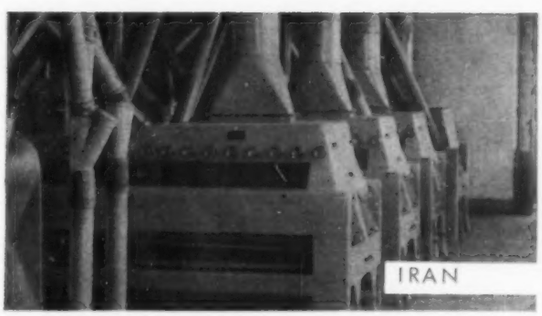
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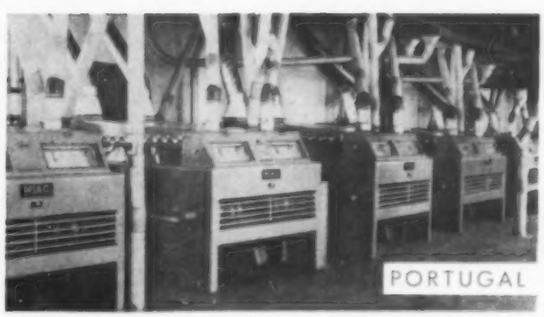
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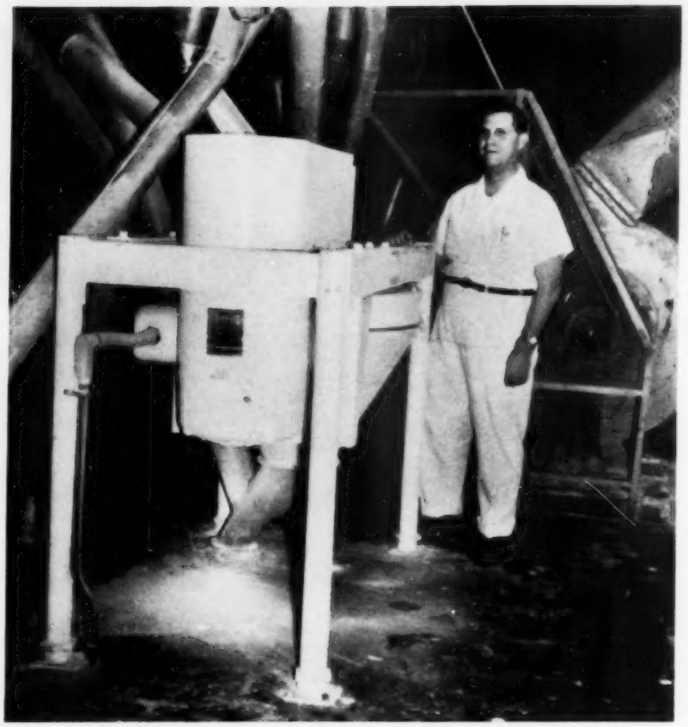
# Experiences Using Impact Mills In Normal Roller Mill Positions

THREE flour mills in the Southeast have substituted centrifugal impact mills in specific grinding positions normally occupied by the conventional roller mill and/or its supplement, the middlings mill. The impact mills are designed and manufactured by the Entoleter division of Safety Industries, Inc., New Haven, Conn.

The grinding principle involved is different from that employed by the roller mill (pressure and shear) or the middlings mill (pressure and attrition). Flour middlings, or other stocks to be reduced, are spouted to the impact mill where a rapidly revolving rotor of pin-type construction, driven by a vertical shaft, grinds the material by subjecting it to varying impact velocities obtained by the centrifugal action of the mill. Flexibility is provided, to permit usage on the many different mill stocks, by rotor and liner variations within the mill or by varying the speed of the rotor.



**Arthur W. Gust, a chemist, inspects a 27 in. Entoleter centrifugal impact mill that was installed recently at the DCA Food Industries, Inc., mill at Ellicott City, Md.**

### Recent Development

Flour millers have been using Entoleter centrifugal machines for the control of infestation in flour, wheat and other mill products. When coupled with an aspirator, it has been used to remove "hidden insect infestation" from the wheat before grinding. But it wasn't until recently that millers began to think in terms of using this centrifugal impact principle for actual grinding operations, the firm reported.

The largest portion of the development work and application engineering on impact milling was done at an Ohio mill grinding both hard and soft wheat. The principles learned have been recently applied at three mills—the Dixie-Portland Flour Co., Chattanooga, Tenn.; Southeastern Mills, Inc., Rome, Ga., and DCA Food Industries, Inc., Ellicott City, Md.

At the Dixie-Portland Flour Mills the primary aim was to get a greater particle size reduction than was being obtained from a series of Buckleys operating on stocks obtained from "head of the mill" dustings. All of the various dustings streams were combined and spouted to one belt-driven impact mill. Not only was increased particle reduction obtained but this also eliminated the gang of Buckleys while reducing the load on the head-end reduction rolls. Reduction of the load carried by the rolls permitted an increase to be made to the bushels per hour capacity of the entire mill flow resulting in a substantial increase in production of flour product, Entoleter said.

At Southeastern Mills the primary goal was to increase capacity (and of course by so doing decrease cost) at a minimum investment. This was most difficult for this mill had practically no space available. By replacing the second mid roller mill with an impact mill, capacity was increased nearly 20% without affecting either extraction or yield. The mill used was a direct connected 27" unit with 15 h.p. rated at 3,500 lb./hr. and requiring only 14.8 sq. ft. of floor space.

### Problem Solved

At DCA Food Industries capacity needed to be increased, but the main plant floor was so crowded that room couldn't be found for additional roller mills. The impact mill provided solution to this problem because of its compactness, Entoleter said. Since the machine had to be put on the spouting floor, the fact that it did not have to be line shaft driven was an advantage.

In each of these three instances, Entoleter said, it was found that as good or better a job of milling could be done with impact mills that have a lower original cost, lower horsepower requirement per unit capacity and a lower maintenance and operating cost.

Other flour mills have installed impact mills for such applications and particle size reduction of finished soft wheat cake flour, to replace fourth and fifth break roller mills and the reduction and clean-up of tail-end stocks, Entoleter reported.

—BREAD IS THE STAFF OF LIFE—

### CONSTRUCTION BEGINS

GREAT FALLS, MONT.—Treasure State Industries, Inc., has announced that construction has started on a 200,000-bu. grain elevator at Inverness, Mont., according to J. J. McCaffery, president. Charles B. Anderson of Great Falls, whose Anderson Grain Co. will operate the elevator, said the investment will be about $130,000, and the elevator is expected to be in operation late in April.

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Ralph W. Tibbils

**GENERAL MANAGER — Appointment of Ralph W. Tibbils as general manager of Rolfes Grain Aeration Cos., Boone, Iowa, was recently announced by George A. Rolfes, president of the firm. Mr. Tibbils, 32, was formerly associated with Tabor & Co., Decatur, Ill., as a registered securities representative and with the Ford Motor Co. as a financial analyst. Earlier he was assistant to the vice president and general sales manager of the Mueller Co., Decatur, for 4½ years. Mr. Tibbils is a graduate of the University of Illinois.**

## Mechanical Drying, Trucking Reported Increasing in Kansas

MANHATTAN, KANSAS — Mechanical drying and transportation by truck are making greater inroads on the Kansas grain business, L. Orlo Sorenson, agricultural economist at Kansas State College, has reported. A recent survey of elevator managers, he noted, indicates that they expect to dry more grain each year for the next 10 years.

Most operators, Mr. Sorenson said, consider mechanical dryers highly desirable or moderately desirable property not merely for profit, but to boost their competitive position by offering better service to customers. Also operators can handle higher moisture grain without as much risk of loss.

"A trend toward more feed crops, particularly fall harvested crops, is an important trend in anticipated use of a grain dryer," Mr. Sorenson commented. Hybrid sorghums have hiked the position of grain sorghum in Kansas, he continued, but the larger heads lead to more lodging and increase the need for artificial drying.

The average cost of installing and maintaining grain dryers indicated by the elevator operators, Mr. Sorenson added, is about $2,000 a year for a 400-bu.-hr. dryer. "With an annual fixed cost of this size, it would require the income from over 40,000 bu. grain dried at 5¢ bu. to pay annual ownership costs of the dryer," he said.

Mr. Sorenson reported that another survey is under way concerning the transportation movement of grain in a 10-state area including Kansas. Trucking in recent years, he said, has offered a great deal of competition to the railroads.

More than 27 million bushels grain was shipped out by truck from Kansas elevators during the year ending Sept. 30, 1957, with about 40% of the trucked grain going outside the state. Another 26 million bushels corn, oats, grain sorghums and other grains was trucked to the elevators.

## SHIP LOADING RULES BEING STUDIED

**DULUTH, MINN.—Rules for handling foreign vessels in loading grain when the St. Lawrence Seaway opens this spring were discussed here at a meeting of grain leaders from Minneapolis and Duluth. This was another meeting to formulate regulations which are designed to speed the vessels' turn-around time. The regulations are expected to be completed in April before the shipping season opens. Problems being studied involve inspections, sanitation, weighing and other phases of grain handling. Taking part in the meeting regarding the Duluth port operations are executives of grain exporting, terminal elevator and merchandising companies.**

## Dock Expenditure

NEW ORLEANS — An expenditure of $22,081 for improvements to the public grain elevator has been authorized by the New Orleans dock board. Marine unloading towers and foundations for additional storage facilities will be constructed. The two projects are part of the board's $8,450 000 program of improvements for the elevator, designed to meet increasingly high movements of grain through the port.

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**INSIDE SCIENCE** **LATEST REVISION**

# The Vital Story of MILLED WHITE RICE

***Enriched with Vitamins and Iron for Better Health***

*by* Science Writer

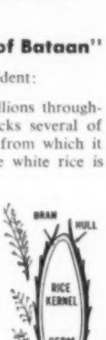
A second "Battle of Bataan" in the Philippines has proven beyond all doubt the value of vitamin enrichment to consumers of white rice.

The famous Bataan experiment in 1948-1950 proved conclusively that whole populations can benefit from enrichment of white rice with vitamins and iron, that disease and death caused by dietary deficiencies can be overcome, that enrichment is a key to better health among infants, children and adults.

### What Happened at the Second "Battle of Bataan"

Before the start of the Bataan trial, these facts were evident:

- Polished white rice is the principal food of millions throughout the world. Good food though it is, it lacks several of the key nutrients occurring in the brown rice from which it is milled, and beriberi is often common where white rice is the main food.
- In the Philippines, beriberi was common and mortality from it high.
- Beriberi is caused by insufficient vitamin $B_1$ in the diet. It yields when vitamin $B_1$ is given to its victims. It does not occur when human beings receive enough of this vitamin in their diet.
- To prevent beriberi where white rice is the main food, vitamin $B_1$ must be added to the diet, either by itself or in food such as rice.
- For centuries it has been universal practice to rinse rice before cooking, hence vitamin $B_1$ (and any other water-soluble nutrient factor) should be added in such a way that it will not dissolve out.
- Through a process developed in the laboratories of Hoffmann-La Roche, it is possible to enrich white rice with water-soluble vitamins and iron so they will not wash off during this rinsing prior to cooking.



With these facts known, the second "Battle of Bataan" began. Through the cooperation of Philippine public agencies, the Williams-Waterman Fund, the USPHS, and Hoffmann-La Roche a controlled experiment was set up in the province of Bataan. More than 12,000 medical examinations were made, before the enrichment of rice began. Nearly 13% of those examined had beriberi.

Enriched white rice was then put into commerce in the experimental area, but not in the control area.

What happened? *Within two years beriberi was practically wiped out in the experimental zone! . . .* beriberi mortality dropped almost to zero . . . almost 90% who had symptoms of the disease before enrichment's start were free from signs of the disease or were greatly improved . . . thousands of people were helped to better health. News of the success of enrichment reached people in the control area and caused them to demand that their rice be enriched, too.

### Other Countries Follow Suit

Word of the excellent results of the Bataan experiment fanned out throughout the world. The largest rice miller in Thailand marketed enriched white rice with success in 1951. In that year, also, the Puerto Rican government enacted legislation requiring that all white rice sold there be enriched, beginning early in 1952. Since then, enriched rice has been made available to the public in Cuba, Venezuela, Colombia, The Dominican Republic, Taiwan (Formosa), Singapore, and Australia.

### South Carolina First To Adopt Enrichment

South Carolina, a state having high per-capita white rice consumption, requires by law that all white rice sold there be enriched with vitamin $B_1$, niacin, and iron, with vitamin $B_2$ to be included at a later date. This state has required enrichment of white flour and corn meal since 1942 and 1943 respectively.

### Federal Standards of Identity Now In Force

The U. S. Food & Drug Administration established the following Standards of Identity for enriched rice which must contain at least 85% of the minimum quantities, shown below, after a rinsing test. If the method of enrichment does not permit this rinsing requirement to be met, consumer size packages must bear the statement: "Do not rinse before, or drain after, cooking."

| | Milligrams per pound | |
|---|---|---|
| Vitamin | Min. | Max. |
| Thiamine | 2.0 | 4.0 |
| Riboflavin* | 1.2 | 2.4 |
| Niacin | 16.0 | 32.0 |
| Iron | 13.0 | 26.0 |

*Optional pending further study

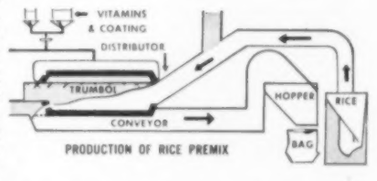
U. S. Federal Specification N-R 351 C requires the same content as the minimum standards shown above.

Popular brands of 'quick cooking' rice are now being enriched with all of the required vitamins.

### How Is White Rice Enriched?

The enriching method in widest use throughout the world employs a method developed in the laboratories of Hoffmann-La Roche Inc., pioneers in the research and production of vitamins.

The Roche method impregnates rice grains with thiamine, niacin, (riboflavin, if desired), and iron and adds a final, outer coating of edible material to protect the vitamins against deterioration and preliminary washing and rinsing. For economy large amounts of vitamins are applied to small amounts of rice to make a "premix". One pound of the "premix" is then mixed with a larger quantity (usually 199 lbs.) of ordinary milled white rice at the mill.



PRODUCTION OF RICE PREMIX

### What of the Future?

The trend to nutritionally-improved foods for better health is definite. The United States, a world-leader in the enrichment of white flour, white bread, corn meal and grits, farina, pastina, macaroni products, and breakfast cereals is now recognizing the need to enrich milled white rice. *When good foods are made better, everyone benefits.*

This article is part of series on the enrichment of processed cereal grain foods which are enriched for better nutrition. It is published by the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. An illustrated brochure containing the text of all articles in the series is available at your request without charge.

## TRADE SHOW

(Continued from page 4a)

bagging scale in 50 to 140 lb. capacity will also be in the booth.

**51-52—Allis-Chalmers Mfg. Co.,** Milwaukee, will show a dimensional display of its new double deck, all-metal purifier. The unit is designed for maximum cleanliness and capacity, lower operating air consumption and greater flow flexibility, the firm said. The display will also illustrate the fewer working parts involved in the new purifier and the resulting reduction in maintenance, the firm added.

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**53—Scandinavia Belting Co.,** Charlotte, N.C., has developed a strong, lighter weight, more flexible, and fire resistant type of belting for elevator (both short and long high speed legs) and conveyor applications. Scandura, as it is called, carries the first fire-resistant designation number issued by the U.S. Bureau of Mines—U.S.B.M. 28-1—it is widely used in deep mining and similar operations. This type of belting is now available in widths and weights applicable to the flour and grain industries and will be displayed in the Scandinavia booth.

**55-56—Screw Conveyor Corp.,** Hammond, Ind., will have an exhibit which will consist of panel displays of its Winona grain elevator bucket, model screw conveyor unit and a model of its Hammond screw-lift. Representatives will be in attendance at all times for consultation on these products as well as others that the firm manufactures.

**57-58—The Fuller Co.,** Catasauqua, Pa., will not have equipment in its booth. The display will illustrate recent advances in the field. Personnel to attend from Catasauqua will include D. K. Banks, J. S. Benko, C. C. Kaesemeyer and J. A. Nicols. G. H. Healey and P. M. Klein, both from the Chicago district office, will also attend, as will Dave Armstrong from the Kansas City district office.

**59-60—General American Transportation Corp.,** Chicago, will exhibit its operating model Airslide car. To date, approximately 3,600 Airslide cars are in service principally for the milling and baking industries. A cut-away hopper section of its new Dry-Flo car will also be shown. The Dry-Flo car is designed to handle products not susceptible to fluidization, such as wheat, corn, and similar grains, as well as feed ingredients.

**62—Industrial Processes, Inc.,** Portland, plans to exhibit its dry flow meter, a small vacuum filter station which could be used for wheat washer flows of 10 gal. min. for recovery of the wheat solids under the IPI Recovery System, and pictures, etc., of present installations. The dry flow meter is a device for the control of the various streams within the mill and indicates, records on a 24-hour chart, and totalizes the stream flow. The IPI Recovery System is a system for the recovery of the dried products from the flow of the wheat washer.

**63—Huntley Mfg. Co.,** Brocton, N.Y., will feature the Monitor regular line of grain separators, cleaners and scourers, with special emphasis on the Monitor new improved "Q" type super-capacity separator, with capacities of up to 8,000 bu. hr. Personnel on hand will be Lester Johnson, special factory representative, and Oscar Olsen, Midwest representative.

**64—Fruehauf Trailer Co.,** Detroit, will feature large photos and specific information pertaining to its new triple panel "Airslide Bulk Flour Trailer" as well as latest design bulk flour units with screw type unloading facilities. R. K. Morgan, product manager, bulk commodity transport division of Fruehauf, Detroit, will attend the conference and be on hand in the booth for the trade show.

**65—G. H. Tennant Co.,** Minneapolis, will have two machines on display in its booth. One, the Tennant Model E floor machine, is used for cleaning wood and resilient tile flooring. Equipped with a cylindrical steel wool roll, this machine removes embedded soilage, skid marks and other types of debris that tend to stick to the surface. The Tennant Model 40 electric power sweeper is a new sweeper soon to be introduced. It has been designed primarily for use in crowded congested areas such as flour mills and where the use of gasoline equipment is not desired. A feature of both of these machines is the fact that they are vacuum equipped so that whether in a cleaning or sweeping operation dust is controlled.

**66—Western Oh-Zo-Dry Co.,** Tonganoxie, Kansas, plans to exhibit various waterproofing coatings, concrete finishes, rust-resistant mastics and patching materials that it manufactures. All of its coatings and materials are soybean oil base, lead free, fume proof, mildew resistant and nontoxic, the firm said.

**67-70—Simon-Carter Co.,** Minneapolis, will have a "wheel of fortune" as the center attraction in the booth. Contests for prizes will be conducted each half day from Sunday noon through Thursday noon, and a grand prize drawing will be held Thursday noon. Two new machines will be shown: the Type "D" Simon pneumatic aspirator and a new model Carter disc separator. In addition, there will be blow-up illustrations of several other machines and various installations.

**71-74—Buhler Mill Engineering Co.,** Minneapolis, plans to exhibit its four-roller mill, Type MDDC, with pneumatic engaging and disengaging of rolls, water cooling, chain drive, roller bearings, speed regulator; impact finisher, Type MKL; vibro-feed apparatus, Type DMVS, with control panel; model of Buhler flour mixing and discharging machine, Type MFS; fluid-lift and blower assembly.

**75—Salina Manufacturing Co., Inc.,** Salina, Kansas, will feature a twin Aerolock bulk flour car unloader with a capacity in excess of 1,000 lb./min. in its display of equipment for pressure pneumatic conveying and bulk storage of mill products. Also displayed will be the "Blendvane" feeder which will feed 1,000 lb./min. of flour, using a ½ h.p. motor. This low horsepower, self-cleaning and nonflushing characteristics make the feeder applicable for installations where previously "twin screw" feeders were used, the firm said.

**76—Ferguson Fumigants, Inc.,** Ferguson, Mo., will exhibit its low dosage spot, space and grain fumigant in various packages and formulations. The "Little Squirt" spot fumigant applicator on which the firm recently received U.S. Patent No. 2,876,932, will be exhibited with all of the improvements which have been made in it during the past year. For the first time, the new line of Dawson concentrated insecticides, especially formulated and adapted to milling industry application, will be on display, the firm said.

**77—Bemis Bro. Bag Co.,** Minneapolis, will have on display a new high speed Deltaseal shaper, which is one of a family of machines consisting of units which firmly pack and close Deltaseal bags. It performs a shaking operation which takes place after the filling operation and before the closing operation.

**78—W. S. Tyler Co.,** Cleveland, will feature the Ro-Tap testing sieve shaker, Tyler standard screen scale sieves, stainless steel bolting cloth, Dur-Loy free bolting cloth, Tyler bond-tite edging and Tyler purifier cloths. V. A. Kaufmann will be in charge of the exhibit.

**80-81—Sterwin Chemicals, Inc.,** will show its chemical feeder which will be mounted on a stand for hopper and ejection dispersion and also mounted on a scale that weight disappearance may be checked and recorded. Sterwin will also display samples of its Oxylite and Vextram products. The firm will also conduct a guessing contest as to the rate of stock being fed through the feeder during a given time.

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## SYMPOSIUM

(Continued from page 1a)

Milling Co., Ltd. He declares: "On a subject such as this, one has to get down to fundamentals to determine why there should be a problem. It is not much use comparing the situation with Russia since the element of compulsion does not exist in North America, nor would there necessarily be the competition of other industry for candidates directed into flour milling in that country. In a free society, if we are not able to develop the talent necessary to insure the technical progress of our business we have to determine why flour milling has not been attractive enough to induce intelligent young men to make it a life career."

### Reason for Shortage?

Since there is a dearth of young men eager to train for a milling career, let us examine a possible reason.

Bay State Milling Co. executive vice president, George E. Kelley, puts it bluntly: "I think the milling industry should review the basis of compensation to the chemists and other technical personnel; otherwise, we are going to continue to lose very valuable young men to other industries."

Time and time again, that same point of compensation was made by other millers consulted. Take, as typical, the remarks of Philip W. Pillsbury, chairman of the board, the Pillsbury Co., himself qualified as an operative miller. "We must never forget that our industry is progressive, challenging and dynamic. Only by obtaining the very best people, and providing them with proper rewards, can we expect to prosper and keep pace with other expanding technologies."

Is it the paucity of monetary reward which is deterring the young men from entering the milling business? And do they have some concern about the physical effort involved? Do they know of the improvements which have gone to make milling a "clean" business?

To answer these points, let us return to Canada's Graham MacLachlan who, summing up the situation for Canada, cites circumstances which hold true for the U.S., too. He states: "In the past flour milling has not enjoyed a 'good press'. A reputation has been gained that it is an industry of lower than average remuneration, involving hard physical labor, with unpleasant working conditions. This situation is no longer true, with our wages, if anything, being well above average, and the industry also providing much steadier work than many other spectacular ones. Mechanization has, to a considerable extent, eased the amount of physical effort required, and the plants are kept clean and free from dust."

Those are the conditions which the young high school graduate can expect to find in the majority of mills today. Here he will work on his climb to the top. "Realization of these facts," comments Mr. MacLachlan, "will help the fundamental situation."

There will always be a conflict of opinion within the industry concerning the respective merits of on-the-job training and an intensive college course. It boils down to the age-old argument of practical experience versus theoretical knowledge. But there is surely a place for both and at K-State there will be facilities for both when the new mill comes into operation.

Here is how E. Walter Morrison, president, the Morrison Milling Co., sees the problem: "Many superintendent millers now in charge of milling plants secured their training as apprentices, and progressed upward in responsibilities only when intelligence, ambition, willingness to work, and determination to pay the price of success existed within the individual being trained. Having attained top operating responsibilities, superintendents frequently think the path they took is the best, if not the only road, to milling knowledge and skill required to produce flour."

Education will not replace experience, Mr. Morrison admits, but it does give the individual possessing it a head start in his race towards accomplishment, and equips him with reserves of knowledge and theory derived from the catalogued experience of predecessors which add power to his efforts and speed his progress.

### Supervisory Responsibility

Mr. MacLachlan has something to say about on-the-job training, too. Traditionally, he points out, a young man was expected to start out with the most menial tasks, and after many years he might pick up enough technical knowledge to warrant slow promotion toward the better positions in the mill. Now it is essential, with guidance from someone particularly

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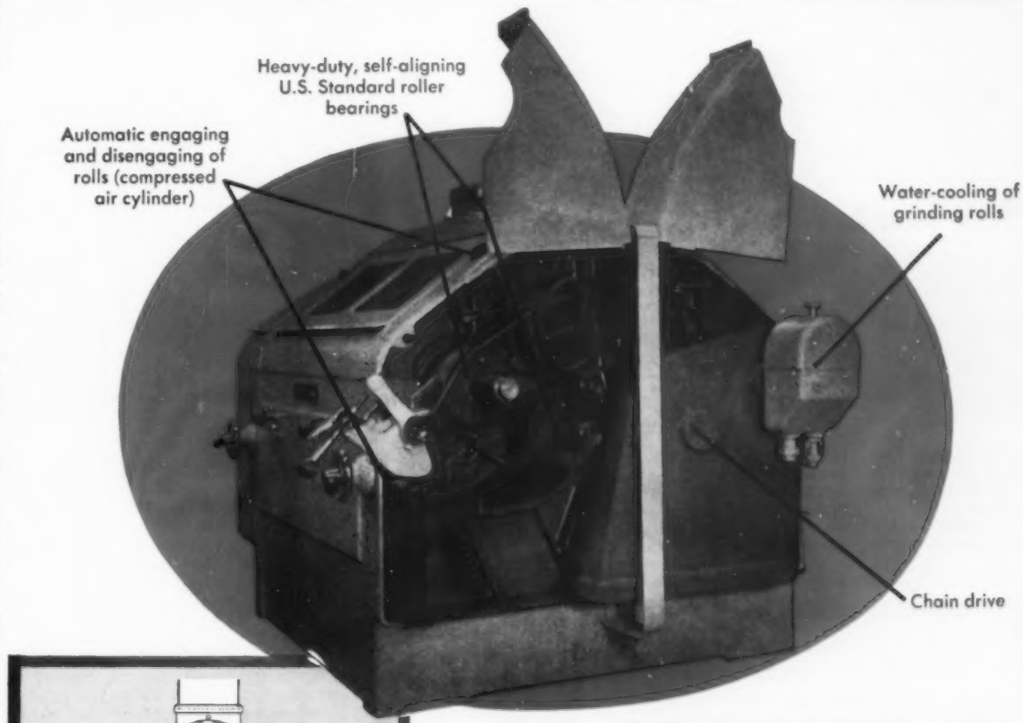
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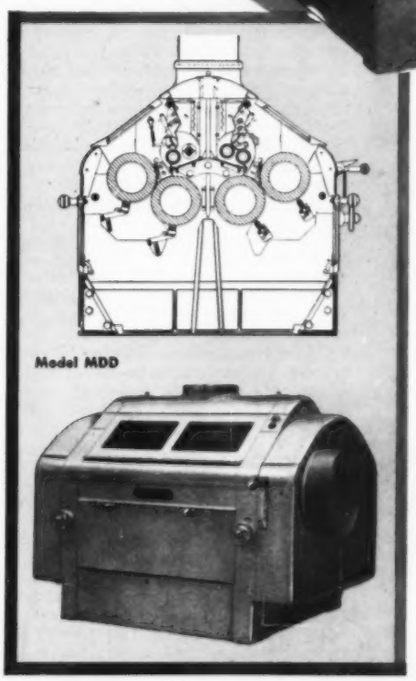


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concerned in top management, for the local technical supervisors to go out of their way to pass on quickly every bit of technical knowledge they have gained throughout the years to younger men who show the aptitude for learning.

Enlarging on his point, Mr. MacLachlan says: "As not all supervisors are natural teachers, it is necessary that their efforts be directed and supplemented through a central training program conducted by someone who understands the principles of imparting knowledge. A person who has an aptitude for teaching, in addition to his own personal technical knowledge, is an important asset to any company and should be recognized as such."

The success of the teaching program at Maple Leaf will be readily apparent to any one who follows the affairs of the Association of Operative Millers—first and third places in a recent essay contest organized by District No. 8 went to Maple Leaf men—Eamon P. Ferguson and Edward Mills. And the second place went to a man from the International Milling Co. plant in Buffalo, Robert L. Shipp, another item of significance. International is one of the biggest users of AOM's correspondence course, the course which could be gainfully employed as the "central training program" about which Mr. MacLachlan speaks.

### Union Involvement

The unions also play an important part, Mr. MacLachlan considers. He says: "If they insist, as some of them do, that superior ability shall not be a main criterion for advancement, but that seniority with only enough ability to barely get by is sufficient, then it may be necessary to introduce training methods outside the important group of union employees. This is a most unfortunate step, and the young men of intelligence within the union movement should have something to say about it so as to preserve their own futures, as well as the ultimate future of the union itself."

A young man who makes a showing of aptitude, intelligence and ability in the mill might be worth sending to K-State.

John L. Locke, president, Fisher Flouring Mills Co., points out that the facilities for training flour milling technicians in the U.S. have at times exceeded the demand. During such periods it has been suggested that the milling industry provide scholarships to attract candidates. "Under these conditions, it may be that technical specialized training should be developed as a supplement to on-the-job training and experience," he recommends.

Mr. Pillsbury has something to say on this subject. He declares: "A dual approach must be taken to solve the shortage of first class milling technologists. The avenues for improvement are open both to educators and milling companies."

He continues: "The schools must attract people of caliber equal to those going to other industries, and they must vigorously counsel students in the great opportunities that exist in the milling industry. The schools must also develop a broader understanding of production management. They must be more than trade schools, and must resist perpetuating the methods of the past. Simultaneously, milling companies must provide the opportunities for talented people to utilize fully their leadership qualities and their specific training in the science of milling."

### Scope of the Program

What of the scope of the training program at the college level? Fred M. Atkinson, chairman of the board, Atkinson Milling Co., has some thoughts on the subject. Agreeing that the industry does, indeed, need more and better trained milling technologists and cereal chemists, he comments: "But the reality of a vital difference between individuals making up the group in question is not often generally recognized. This difference is all too often overlooked even when considering executives as a class. I am referring to the difference between the competent technologist or specialist, who works to existing standards, and the more rounded individual who can think and work imaginatively, creating new products and methods."

The highest aim of any training program is to turn out as many as possible with ability in the latter category. Because of this need, Mr. Atkinson suggests that in the specialized training program, there be included one subject course of a broadening or curiosity developing nature. He examples personnel relations, English, public speaking and economics.

### Support for K-State

A strong body of management opinion supports the efforts being made by K-State to revitalize its milling school. Says Mr. Kelley: "I feel it is of vital importance to the flour milling industry to continue education in milling and grain research at Kansas State College." And Mr. Morrison: "The American milling industry should spare neither efforts nor expense in providing the means whereby education in milling technology can be gained by those who must carry on future milling efforts, remembering that flour milling is a permanent industry."

For an effective summation of the whole problem and the issues involved, here are some comments from Leslie A. Ford, president, Shawnee Milling Co. He says: "Technical training of young men for the milling industry was largely confined to conversation until postwar adjustment within the industry brought the need for such technical men into sharp focus. While there seemed to be considerable overproduction of milling capacity, the technical know-how, conversely, was in short supply.

"Out of the ashes of the old milling school at Kansas State College a new, ultra-modern mill is scheduled to arise which, of itself, will provide adequate motivation and facilities for training first class technical men. Furthermore, there is an increased interest among companies, both large and small, to support the school.

"In my opinion," Mr. Ford declares, "all millers should urge their high school graduates to seriously consider Kansas State College milling school."

### The Problem Answered?

Has Mr. Ford provided the answer to the problem? It could be: "Catch them young!" It is up to the millers themselves, to make these youngsters, preparing for a career, understand the advantages of working in milling. Through the operation of pension plans, senior positions will become more readily available than in the past. Promotion is not a matter of waiting for dead men's shoes. Education and ability will out.

They should be told that there is determination within the industry to give recognition to the importance of the technical man in the flour mill, in the cereal chemistry laboratory and in the all-important research department. Food development is a growing business and the milling industry has played, and is playing, an important part.

To the enterprising youngster, there is a bright future in an industry which provides one of the world's staple foods—flour for man's bread, his cookies and his cakes. But it is up to the millers to garner those high school boys and inculcate into them an enthusiasm for an industry to which they, themselves, have dedicated their lives.


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. . . just came from the bag-filling department . . . Not a man wearing a respirator.
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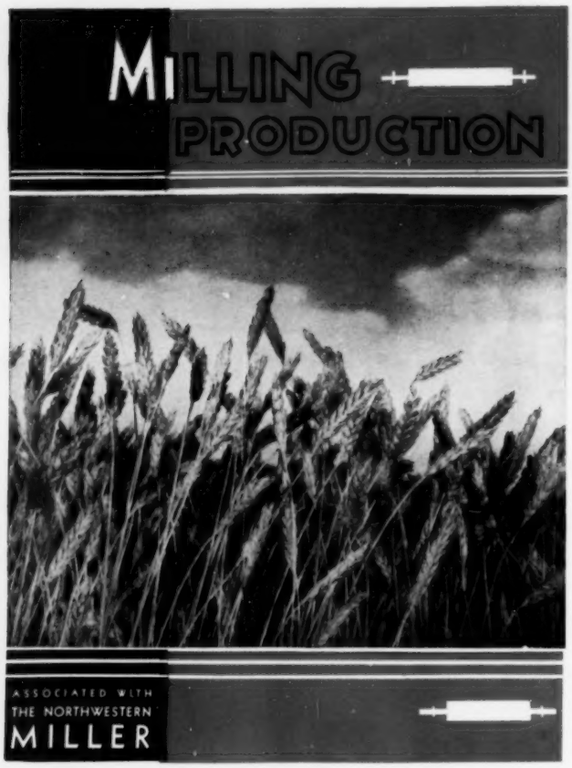


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